

HELMINTHOLOGICAL ABSTRACTS

incorporating
BIBLIOGRAPHY OF HELMINTHOLOGY
COMPILED FROM WORLD LITERATURE OF 1956



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HELMINTHOLOGICAL ABSTRACTS

INCORPORATING BIBLIOGRAPHY OF HELMINTHOLOGY

FOR THE YEAR 1956

Vol. 25, Part 2/3

43—Acta Medica Scandinavica.

- a. TÖTTERMAN, G. & AHRENBERG, P., 1956.—“The age distribution in pernicious tapeworm anemia and Addisonian pernicious anemia.” 153 (6), 421-426.

(43a) Age distribution among patients with tapeworm anaemia shows greater resemblance to that of Addisonian pernicious anaemia than has been recorded by previous observers, but its incidence is somewhat higher in the younger age groups and there is a certain decrease in the very old age groups. Their great similarity suggests that the pathogenesis of the two diseases is similar in many respects. The stomach is a factor in the development of tapeworm pernicious anaemia as it is in Addisonian pernicious anaemia.

R.T.L.

44—Acta Parasitologica Polonica.

- a. ZARNOWSKI, E., 1956.—“Robaki pasożytnicze drobnych ssaków leśnych (Rodentia i Insectivora) okolicy Puław (woj. lubelskie). I. Cestoda.” 3 (13/19), 279-368. [English & Russian summaries pp. 344-368.]
- b. DRYGAS, M. & PIOTROWSKI, F., 1956.—“Materiały do fauny robaków pasożytniczych przewodu pokarmowego zająca *Lepus europaeus* Pall.” 3 (13/19), 377-396. [English & Russian summaries pp. 393-396.]
- c. KISIELEWSKA, K., 1956.—“Badania nad rozwojem larw *Drepanidotaenia lanceolata* (Bloch) w żywicieli pośrednim.” 3 (13/19), 397-428. [English & Russian summaries pp. 423-428.]
- d. GUTTOWA, A., 1956.—“O inwazyjności onkosfer *Triaenophorus lucii* (Müll.) i jej zmienności.” 3 (13/19), 447-465. [English & Russian summaries pp. 464-465.]
- e. BEZUBIK, B., 1956.—“Materiały do helmintofauny ptaków wodnych Polski.” 4 (1/7), 59-88. [English & Russian summaries pp. 85-88.]
- f. WIERZBICKA, M., 1956.—“Wyniki sztucznego zarażenia *Cyclops vicinus* Ulj. larwami *Proteocephalus percae* (O. F. Müller).” 4 (1/7), 89-100. [English & Russian summaries pp. 97-100.]
- g. PREIBISCH, J., 1956.—“Zmiany anatomopatologiczne wywołane u jelenia (*Cervus elaphus* L.) przez *Wehrdikhmansia cervipedis* (Wehr et Dikmans, 1935) Caballero, 1945.” 4 (1/7), 101-106. [English & Russian summaries p. 105.]
- h. PATYK, S., 1956.—“Zarobaczenie przewodu pokarmowego owiec i kóz na Ziemiach Zachodnich.” 4 (1/7), 107-146. [English & Russian summaries pp. 145-146.]
- i. ŚLUSARSKI, W., MARKIEWICZ, K. & STEFANSKI, W., 1956.—“Nowy przypadek dermatitis verminosa u psa spowodowanej inwazją larw *Rhabditis strongyloides* Schneider, 1866.” 4 (1/7), 163-174. [French & Russian summaries pp. 171-174.]

(44a) During his study of the tapeworms of small mammals of the forest near Puław in Poland, Żarnowski examined ten rodent and five insectivore species. The 19 cestode species found are listed under their hosts, of which several are new host records. Analysing Spasski's (1954) classification of Hymenolepididae in mammals, Żarnowski considers valid *Armadolepis* and *Coronacanthus*, but disagrees with the creation of the genus *Mytolepis* for *Dicranotaenia crimensis*. He also questions the placing of *Hymenolepis erinacei* and *H. muris-variegati* in *Rodentolepis* and of *H. peramelidarum*, *H. semenovi*, *H. magnirostellata* and *H. neomidis* in *Vampirolepis*. He now transfers his *H. stefanski* to *Vampirolepis*. The net-like uterus, characteristic of *H. diminuta* and *H. horrida*, was observed in *H. straminea* and *H. asymmetrica* which Spasski had placed in *Rodentolepis*. *Insectivorelepis* n.g. is made for those cestodes from Insectivora, with unilateral segments, no hooks or rostellum, a large scolex, a sac-like uterus and with the three testes in a line or triangle. This new genus includes the type

I. globosa n.comb., *I. globosoides* n.comb., *I. kenki* n.comb. and *I. infirma* n.sp. from *Sorex araneus* and *S. minutus*. On close examination of Żarnowski's material of *H. diaphana*, three not two, testes were found per segment and the species is therefore transferred to *Soricinia* as *S. diaphana* n.comb. and the genus *Ditestolepis* is discarded. In the author's opinion the diagnosis of *Soricinia* should be extended to include species with testes in other positions than position VI of Skryabin & Matevosyan's system (1945). In this genus are included *S. macedonica* (Locker & Rausch, 1952) n.comb. and *S. tripartita* n.sp. from *Sorex araneus*. Żarnowski found that the terminal sucker of *Pseudodiorchis* can be a terminal infundibulum formed by the retracted rostellum and describes *P. multispinosa* n.sp. from *S. araneus*. In Anoplocephalidae the author confirms the synonymy of *Aprostataandrya* (*A.*) *macrocephala* (Douthitt, 1911) Spasski, 1951 and *A. caucasica* Kirschenblatt, 1938. G.I.L.

(44b) During a survey of the parasites of hares in Poland, 617 *Lepus europaeus* were autopsied and *Mozgovoyia pectinata* was found in 8.8%, *Andrya rhopalocephala* in 1.5%, *Trichostrongylus retortaeformis* in 55.1% (usually with 50 to 70 specimens per animal), *Graphidium strigosum* in 3.1% (with less than 10 worms in each) and *Trichuris sylvilagi* in 72% (with an average of 38 worms per host). The pathogenicity of each species is briefly discussed. G.I.L.

(44c) The development of *Drepanidotaenia lanceolata* in experimentally infected *Cyclops strenuus strenuus* and *Eucyclops serrulatus* was studied by Michajlov's (1953) method of keeping each cyclops separately under frequent observation and sketching individually visible larvae. In these cyclops the oncospheres rid themselves of the first egg covering mechanically by bursting or splitting it. The next two coverings are probably digested by the host and the fourth covering is disposed of mechanically. There follows a discussion of the general course of development, the effect of time and temperature and the number and location of larvae in the body-cavity of the intermediate host. G.I.L.

(44d) Using *Cyclops strenuus strenuus* and *Eucyclops serrulatus* as hosts, Guttowa has studied the infectivity of day-old larvae of *Trianaenophorus lucii* after the eggs had been subjected to low temperatures. Larvae from eggs kept at room temperature (17–20°C.) invaded the hosts at the average rate of six to seven per cyclops and this was taken as 100% infectivity. Eggs were kept at 0°C. to 2°C. for periods of 7 to 42 days and then returned to room temperature. Those hatched on the first day at room temperature showed an infectivity of nil to 11% regardless of the cold period. Infectivity increased to a maximum in larvae hatched on the 3rd to 4th day, depending on the cold period, e.g. larvae hatched on the fourth day from eggs cooled for seven days gave a maximum infectivity of 34.4%. 20% of coracidia which had been subjected to -4°C. for 90 minutes and larvae which hatched from eggs frozen at the fifth day of development for up to 24 hours were motile but non-infective. G.I.L.

(44e) Bezubik, having studied over a period of eight years the helminths of 22 species of aquatic birds (excluding Anatidae) in Poland, notes a dependence of the composition of the helminth fauna on the host's food especially fish, insects and insect larvae, molluscs and crustacea. The heavy infection of *Fulica atra* and *Gallinula chloropus* which feed at first on plants and then on aquatic invertebrates is striking. But in Poland where these birds first feed on animals the percentage of infection reached is very high. Most of the helminths found occur also in Western Europe and in Russia, but 35 species are now recorded from Poland for the first time. R.T.L.

(44f) The lower degree of infection of *Cyclops vicinus* with the larvae of *Proteocephalus* sp. in the Galwe Lake, near Wilno, as compared with that found in *Cyclops kolensis* in the Mamry Lake in north-eastern Poland is attributed to the failure of the cyclops to contact the embryophores owing to their different distribution in the lakes. When the cyclops contained only one to three larvae there was an even development of proceroids but with greater number it was uneven. In mature male and female cyclops the *Proteocephalus* larvae were found in the abdomen, cephalothorax and thorax. The tapeworm develops as normally in larval cyclops at the fourth and fifth stages as in adult cyclops. R.T.L.

(44g) The skin lesions caused by *Wehrdikhmansia cervipedis* in *Cervus elaphus* consist of nodules in which the parasites are coiled in bundles. Microscopically there are more pronounced tissue reactions around disintegrated worms. R.T.L.

(44h) Twenty-four nematode and two cestode species were found in 50 sheep from the Wrocław region and 19 nematode and two cestode species in 58 goats from various districts of Poland. The number of worms collected from a single sheep ranged from 1 to 55,782 and from a single goat from 1 to 54,305. Data, largely in measurements, are given for each species, while those not included in Żarnowski's (1949) work are illustrated and described in detail. *Trichostrongylus* sp. I from the goat and sp. II from sheep and *Nematodirus* sp. from sheep which could not be included in any of the known species are also described. G.I.P.

(44i) Scrapings taken from bare patches formed on the skin of a dog brought to a veterinary clinic in Poland contained larvae which were identified by culturing as *Rhabditis strongyloides*. G.I.P.

45—Agricultural Chemicals. Baltimore.

- a. COMPTON, C. C. & BENEDICT, S. H., 1956.—“Nemagon (1, 2-dibromo-3-chloropropane) a soil fumigant.” 11 (3), 46-47, 125-126.

(45a) This is a popular account of the uses of Nemagon as a nematicide. It can be applied to some living plants, e.g. peach trees and lawns without damage, but tobacco, onions, garlic and some others are injured. It is applied as a liquid in the row at 0.5-2.5 gal. per acre or broadcast at 1.25-10 gal. per acre. It is also made up in granular form. It is said to control at least eight species of plant-parasitic nematodes but its effects are slow. M.T.P.

46—Agricultural Gazette of New South Wales.

- a. ANON., 1956.—“Internal parasites of cattle.” 67 (2), 86-89; (3), 140-143, 157.
 b. ANON., 1956.—“New plant diseases.” 67 (3), 139.
 c. ANON., 1956.—“Foliar nematode disease of ferns and begonias.” 67 (5), 258-259.

(46a) Internal parasites frequently cause serious losses in cattle in the higher rainfall areas of New South Wales. They are also prevalent throughout the coastal areas and occasionally cause trouble particularly in wet seasons on the tablelands and further inland. The following are listed: *Haemonchus contortus*, *Bunostomum phlebotomum*, *Cooperia* spp., *Bosicola radiatus*, *Dictyocaulus viviparus*, *Trichostrongylus* spp., *Ostertagia ostertagi*, *Moniezia benedeni* and *Trichuris* spp. The use of tetrachlorethylene, bluestone with nicotine sulphate, and bluestone with arsenic, has almost entirely been replaced by phenothiazine. The Division of Animal Industry of New South Wales recommends the adoption of the following programme for the control and prevention of helminth infestation in farm stock. (i) Provision of well drained pastures and avoidance of overstocking, (ii) rotational grazing, (iii) maintenance of an adequate standard of nutrition, (iv) adoption of a strategic drenching programme, viz., for dairy stock in February or March, in June or July and in September or October, and for beef cattle in February or March and at weaning. Hexachlorethane is highly effective against liver-fluke but only partly effective against amphistomes; the latter are widely distributed throughout the coastal districts. The application of powdered bluestone to small wet areas and stagnant creeks is advised. R.T.L.

(46b) New plant diseases now recorded for the first time for New South Wales include: *Aphelenchoides olesistus* in *Adiantum aethiopicum*, *Asplenium bulbiferum*, and *Phyllocactus* sp. R.T.L.

(46c) During the past two years, ferns and begonias in a number of metropolitan areas in New South Wales have been affected with foliar disease due to infection with *Aphelenchoides olesistus*. The species of *Pteris*, *Adiantum* and *Asplenium* are fully susceptible but some species of *Aspidium* are highly resistant. Gloxinias are also susceptible. Infected ferns should be sprayed with E.605 or parathion (1 oz. 50% emulsion to 5 gal. of water) at intervals of three

weeks as soon as a patchy brown discoloration of the fronds appears. Systox is also effective as a soil drench, applied at the rate of one fl. oz. of 50% emulsion to 4 gal. of water. As E.605 is not effective in controlling the disease in begonias, two applications of Systox as a soil drench at an interval of two to three weeks should be made.

R.T.L.

47—Agricultural Research. Washington.

- a. ANON., 1956.—“Nematode on our side.” 4 (10), 3-4.

(47a) In 1954 Dutky, insect pathologist of the United States Department of Agriculture, discovered a nematode [unnamed], belonging to the family Steinernematidae, in bacterially diseased codling-moth larvae. [See also Dutky, S. R. & Hough, W. S., in *Proc. ent. Soc. Wash.*, 1955, 57, p. 244.] When introduced by the nematode into the body-cavity the bacterium not only kills the insect but also serves as food for the nematode. The bacterium also produces an antibiotic substance which restricts the microflora of the killed insect and thus protects the cadaver from decay. The infective stage of the nematode, an ensheathed second-stage larva, usually enters the insect's mouth and, by penetrating the gut wall, introduces the bacterium which sets up a fatal septicaemia. Each wax-moth larva yields almost 150,000 nematodes. Tests with infected codling-moths on apple orchards have indicated that a 60% to 70% control may be possible. Field tests with infected corn earworm on maize also gave promising results.

R.T.L.

48—American Journal of Pathology.

- a. BATTEN, Jr., P. J., 1956.—“The histopathology of swimmers' itch. I. The skin lesions of *Schistosomium douthitti* and *Gigantobilharzia huronensis* in the unsensitized mouse.” 32 (2), 363-377.

(48a) Batten investigated the response of the unsensitized white mouse to *Schistosomium douthitti* (which reaches maturity in the mouse) and *Gigantobilharzia huronensis* which has been described from several species of birds. Cercariae of *S. douthitti* produced a maculopapular eruption, the macules being 0.3 mm. in diameter and appearing 5-10 minutes after exposure. The papules which appeared 30-60 minutes after exposure, reached 4 mm. in diameter and disappeared completely during the 3rd day after exposure. With *G. huronensis* gross lesions were absent in the majority of cases, but infrequently macules appeared. In both cases the cercariae were observed to penetrate the dermis, either directly or through the pilular apparatus into the sebaceous gland. Within a very short time both species of cercariae were encapsulated by histiocytes; the neutrophilic response remained moderate in both cases for a few weeks. Living cercariae of *S. douthitti* were observed in venules and practically all of the cercariae of *G. huronensis* appeared to have penetrated the epidermis and invaded the subcutaneous tissues. Batten concludes that pulmonary migration of the non-human schistosomes in an unsensitized person must be considered as a very distinct possibility. The paper is supported by excellent photomicrographs.

D.L.H.R.

49—American Journal of Public Health.

- a. ZIMMERMANN, W. J., SCHWARTE, L. H. & BIESTER, H. E., 1956.—“Incidence of trichinosis in swine, pork products, and wildlife in Iowa.” 46 (3), 313-319.

(49a) The source of *Trichinella* infection in grain-fed pigs in U.S.A. is still an unsolved problem, although infected rats and uncooked garbage have been implicated. Attention is now directed to the possibility that wild animals scavenging in pig farms may also act as sources of swine infection. The incidence of *Trichinella spiralis* in native Iowa mammals examined during 1953-55 was, rat 11.8%, mink 14.1%, fox 11.9%, fox cubs 1.8%, opossum 2.5%, raccoon 0.9%, coyote two out of four. There was no infection in 128 musk-rats. The incidence of trichina cysts in bulk sausage in 1953-54 was 2.2%, in 1954-55 0.6%, and in link sausages it was respectively 2.4% and 4.4%.

R.T.L.

50—American Journal of Tropical Medicine and Hygiene.

- a. HSÜ, H. F. & HSÜ, S. Y. LI, 1956.—“On the infectivity of the Formosan strain of *Schistosoma japonicum* in *Homo sapiens*.” 5 (3), 521-528.
- b. HOEKENGA, M. T., 1956.—“Experiments in the therapy of human trichuriasis and hookworm disease.” 5 (3), 529-533.
- c. CARTER, C. H. & MALEY, M. C., 1956.—“Institutional prophylaxis of enterobiasis.” 5 (3), 534-537.
- d. SAWITZ, W. G. & KARPINSKI, Jr., F. E., 1956.—“Treatment of oxyuriasis with pyrrovin-quinolium chloride (Poquil).” 5 (3), 538-543.
- e. WAGNER, E. D. & WONG, L. W., 1956.—“Some factors influencing egg laying in *Oncomelania nosophora* and *Oncomelania quadrasi*, intermediate hosts of *Schistosoma japonicum*.” 5 (3), 544-552.
- f. WAGNER, E. D. & MOORE, B., 1956.—“Effects of water level fluctuation on egg laying in *Oncomelania nosophora* and *Oncomelania quadrasi*.” 5 (3), 553-558.
- g. OTORI, Y., RITCHIE, L. S. & HUNTER, III, G. W., 1956.—“The incubation period of the eggs of *Oncomelania nosophora*.” 5 (3), 559-561.
- h. PAYNE, E. H., GONZALES-MUGABURU, L. & SCHLEICHER, E. M., 1956.—“An intestinal parasite survey in the high Cordilleras of Peru. I.” 5 (4), 696-698.
- i. MAKIDONO, J., 1956.—“Observations on *Ascaris* during fluoroscopy.” 5 (4), 699-702.
- j. DIMMETTE, R. M., 1956.—“Fibrosis of the liver of Egyptian children and adults.” 5 (4), 703-712.
- k. HUNTER, III, G. W., KEMP, H. A., SMALLEY, H. E., WILKINS, O. P. & DIXON, C. F., 1956.—“Studies on schistosomiasis. XII. Some ointments protecting mice against the cercariae of *Schistosoma mansoni*.” 5 (4), 713-736.
- l. BEAVER, P. C., 1956.—“The record of *Ancylostoma braziliense* as an intestinal parasite of man in North America.” 5 (4), 737-738.
- m. PINTO, A. R., COUTINHO COSTA, F., MEIRA, L. V. DE & PACHECO VIANA, J., 1956.—“Effects of tetrachlorethylene without a purge, followed by ferrous sulfate in ancylostomiasis.” 5 (4), 739-741.
- n. HARRY, H. W. & CUMBIE, B. G., 1956.—“The relation of physiography to the types of freshwater environments and the presence of *Australorbis glabratus* in Puerto Rico.” 5 (4), 742-756.
- o. KARTMAN, L., 1956.—[Correspondence.] 5 (4), 757-758.
- p. MAGATH, T. B. & THOMPSON, Jr., J. H., 1956.—[Correspondence.] 5 (4), 758-759.

(50a) Hsü & Hsü infected five human volunteers with the Formosan strain of *Schistosoma japonicum*, four with 400 cercariae and one with two batches each of 400 cercariae. Although the presence of macules and papules at the site of exposure in all volunteers indicated that the cercariae had definitely entered the skin, stool examinations for eggs and liver biopsies for eggs and pigment were negative. The intradermal reaction was positive in all except the volunteer infected with two batches of cercariae; acute abdominal pain occurred in all volunteers, eosinophilia in three and histopathological changes in the liver tissue, similar to those produced by unisexual infections of male worms, were found in two in due time after the exposure. The results prove that the Formosan strain of *S. japonicum* cannot reach its mature stage in men after exposure. Hsü & Hsü conclude that the Formosan strain does develop for a short period in man but must be regarded as a non-human zoophilic strain. D.L.H.R.

(50b) Hoekenga has tested various anthelmintics, or combinations of them, against *Trichuris* in 734 patients and hookworm in 457. Whipcide (phthalofyne) caused conjunctivitis and keratitis and toluene also gave a high percentage of toxic reactions. Results with piperazine salts (adipate, citrate and phosphate) were promising but cure rates were only 50% or less and the author stresses the need for more effective drugs against these two helminths. He obtained the best results with a mixture of 2.7 c.c. of tetrachlorethylene and 0.3 c.c. of chenopodium oil but points out that this mixture should not be given when *Ascaris* are present, simultaneously with alcohol, fats or oils, or when liver disease is present. S.W.

(50c) Carter & Maley have found that *Enterobius* can be eradicated from a group of children in an institution by prolonged treatment with piperazine citrate. Thirty-seven infected children were given 1 gm. piperazine citrate twice daily for six days, followed by 1 gm. twice daily on two consecutive days per week for 14 months. No toxic effects were

observed, all were negative after five months and remained free from infection after 14 months. Six children were treated with 2 gm. of the drug once a week for a year; all were negative after three months and remained so for the rest of the year.

(50d) Sawitz & Karpinski have tested Poquil against enterobiasis in doses of 0.5 mg. to 0.7 mg. per kg. body-weight three times daily for six days. Of 45 patients treated, all were cured even without special sanitary measures. There was a spontaneous cure rate of 20% in 15 untreated patients. No untoward effects of clinical importance were observed but it is possible that a depression of haematopoiesis may occur.

(50e) Wagner & Wong maintained *Oncomelania nosophora* and *O. quadrasi* in unglazed porous clay saucers on substrates consisting of filter paper, soil, gravel, brick, leaf and wood. They found that 91% of the eggs of *O. nosophora* were found on the soil while *O. quadrasi* was less specific in its choice of egg-laying sites. Both species required the presence of water for egg-laying but *O. nosophora* laid fewer eggs than *O. quadrasi* at a lower water level. Better snail reproduction occurred in both species at a medium water level (1/3 saucer capacity). The optimum temperature for egg-laying was 26°C. and fewer eggs were found at low than at high temperatures. On the other hand mortality was lowest at the lower temperature, while at 32°C. the cultures became fouled with algae, mould and rapid organic decomposition. In both species the majority of eggs were laid above the water line.

(50f) Wagner & Moore maintained *Oncomelania quadrasi* in pyrex culture chambers containing a soil-sand mixture, a piece of brick, a piece of wood, maple leaf and filter paper arranged so that half the surface of each was submerged when the dish was filled to a quarter of its capacity. Flooding experiments were then conducted and variable results were obtained but with *O. nosophora* the combined results showed a decrease in the number of eggs laid while with *O. quadrasi* there was an increase in egg laying of the ratio of 22:1. In both species only a small percentage of eggs were laid below the water line. With *O. nosophora* more eggs hatched in the flooded dishes (79%) as compared with controls (50%); in *O. quadrasi* the recovery of young snails was approximately the same being 76% and 72% respectively.

(50g) Otori, Ritchie & Hunter maintained *Oncomelania nosophora* on filter paper in Petri dishes, with decayed leaves and straw as food, mud cubes being included in laying chambers, and investigated the incubation period of the eggs. A few eggs hatched as early as 11-14 days after they were laid; most of the eggs however required a longer period of incubation, a few hatching as late as 35 days after they were laid. Maximum hatching occurred after 24 to 25 days at day-time room temperature of 20°C. to 25°C. in March-April and 18-19 days at 24°C. to 29°C. in May-June. Since fairly uniform conditions are maintained in the Petri dish, Otori, Ritchie & Hunter suggest that some inherent quality of the eggs rather than environment was responsible for the marked range of incubation time.

(50h) Faecal examinations of nine groups of persons (total 1,305) living at different altitudes revealed the presence of *Ascaris*, *Fasciola*, hookworm, *Hymenolepis*, *Taenia*, *Heterodea*, *Trichuris* and *Trichostrongylus*. The percentage incidence of each in each group is tabulated. Variation in altitude had little effect on incidence and there appeared to be no correlation between parasitism and eosinophil count in the 354 persons whose blood picture was studied.

(50i) During 1952-53 Makidono observed 1,937 *Ascaris* infections during the course of some 4,100 fluoroscopic examinations of the gastro-intestinal tract. The distribution of 588 worms (in 87 cases) in the gut is tabulated: 99% were found in the jejunum and ileum (515 and 68 respectively) and there appeared to be a slight preference for the middle third of the jejunum. Resting positions and locomotion in the gut are described. After the administration of anthelmintics the worms became bent with the head and tail at approximately the same level and pointing posteriorly.

(50j) In this study of fibrosis of the liver, Dimmette found that seven of 60 children and 87 of 112 adults (over 14 years old) were suffering from schistosomiasis. There was a marked absence of regenerative changes in the cases of liver fibrosis associated with schistosomiasis. In the adults the presence of schistosomiasis had a profound effect upon the fibrosis, producing both nodular and smooth types. In the absence of schistosomes malnutrition was probably the most important aetiological factor in both adults and children. s.w.

(50k) Hunter *et al.* have tested 127 compounds (as ointments) for their capacity to protect mice against cercariae of *Schistosoma mansoni* during an immersion period of four hours. Ten gave complete protection and, of these, five most nearly fulfilled the prerequisites of an ideal protective ointment (100% protection, non-toxicity, stability, ease of application and removal, low cost, additional repellent properties against insects, etc.). These were (i) 10% Actamer in Silicote, (ii) 5% Actamer, 3% hexachlorophene and 20% benzyl benzoate in wool fat, (iii) 20% benzyl benzoate and Covicone with repellents, (iv) 5% hexachlorophene in wool fat and (v) 3% hexachlorophene and Pro-derna. s.w.

(50l) Beaver does not accept Dove's report, which appeared in *J. Parasit.* 1928, 15, 136-137, and *Amer. J. Hyg.*, 1932, 15, 664-711, of the occurrence of *Ancylostoma braziliense* with *Necator americanus* in a Texas boy. He is of the opinion that only *N. americanus* was present. s.w.

(50m) From observations on 165 cases of ancylostomiasis Pinto *et al.* have confirmed that the omission of the saline purge after treatment with tetrachlorethylene enhances the effect of the drug. The dosage was 0.12 ml. per kg. body-weight (up to a maximum of 5 ml. of tetrachlorethylene) every four days until all hookworms were eliminated. Most of the patients were cured by four treatments or less but two required seven treatments. The effect of ferrous sulphate treatment on the regeneration of haemoglobin was also studied and the results are tabulated. s.w.

(50n) Harry & Cumbie present a detailed study of the fresh-water environments of the three main physiographic regions of Puerto Rico, with particular reference to the presence or absence of *Australorbis glabratus* which is the only known vector of *Schistosoma mansoni* in the island. The snails occurred in some low gradient streams, in the major aqueducts, in disjunct marginal pools along streams, in the estuarine marshes and in the limestone sink-ponds. Although they were present in the limestone area of the north coast, schistosomiasis does not appear to be regularly transmitted there and the possible reasons for this are discussed. s.w.

(50o) Kartman comments on the paper by Magath & Thompson [for abstract see Helm. Abs., 24, No. 330i] in which they draw the conclusion that until a specific cure for trichinellosis is discovered the elimination of the parasites in pork, which would prevent man from acquiring immunity as a result of subclinical infections, "might prove hazardous". In his opinion the major aim of public health is the prevention of naturally acquired infection and he suggests that scientific workers in public health cannot admit the necessity of naturally acquired subclinical infection as a prophylactic measure. If subclinical infection is immunologically beneficial, the provision of infection under strictly controlled conditions should be investigated. s.w.

(50p) Magath & Thompson, replying to Kartman's letter [for abstract see No. 50o above], point out that they do not disagree that the ultimate goal of public health practice is the prevention of infection and disease but they suspect that subclinical, naturally acquired infections provide the most potent protection of the public. They doubt the practicability of irradiation of all pork and pork products on economic grounds. s.w.

51—American Journal of Veterinary Research.

- a. LEVINE, N. D., IVENS, V., KLECKNER, M. D. & SONDER, J. K., 1956.—“Nematocidal screening tests of organic phosphorus, nitrofurans, cadmium, and other compounds against horse strongyle larvae *in vitro*.” 17 (62), 117-120.
- b. RUBIN, R. & LUCKER, J. T., 1956.—“The course and pathogenicity of initial infections with *Dictyocaulus viviparus* the lungworm of cattle.” 17 (63), 217-226.
- c. ALLEN, P. H. & OLDFIELD, J. E., 1956.—“Phenothiazine treatment of fattening lambs in drylot.” 17 (63), 243-245.
- d. THRELKELD, W. L., PRICE, N. O. & LINKOUS, W. N., 1956.—“An observation on the relationship of cobalt deficiency to internal parasites of sheep.” 17 (63), 246-251.
- e. SHUMARD, R. F., EMERICK, R. J., BEMRICK, W. E., HERRICK, C. A., POPE, A. L. & PHILLIPS, P. H., 1956.—“Effects of trace minerals, dicalcium phosphate, phenothiazines and combinations of these on the resistance of lambs to *Haemonchus contortus* and other nematodes.” 17 (63), 252-255.
- f. BELL, R. R., 1956.—“Continuous phenothiazine therapy of dogs artificially infected with *Ancylostoma caninum*.” 17 (63), 279-282.
- g. DOUGLAS, J. R., BAKER, N. F. & LONGHURST, W. M., 1956.—“The relationship between particle size and anthelmintic efficiency of phenothiazine.” 17 (63), 318-323.

(51a) Levine *et al.* have tested 61 chemicals against horse strongyle larvae in faeces and express their results in a table of the lowest Molar and percentage active concentrations. The following were active at a concentration of 0.001M or less: o,o-dimethylhydroxy-2,2,2-trichlorophosphonate (Bayer L 13/59), o-methyl-o-2,4,5-trichlorophenyl phosphoramidothioate (Dow ET-15), cadmium bromide, cadmium acetate and cadmium nitrate. Further studies of a larger series of chlorinated phenylethane derivatives and chlorinated phenylpropene derivatives and related compounds might be rewarding. S.W.

(51b) Rubin & Lucker investigated the course and pathogenic effects of lungworm infections produced by the administration of various dosages of infective *Dictyocaulus viviparus* larvae to uninfected calves and yearlings. Of the 22 test animals nine died of pneumonia or other lung involvements caused directly or indirectly by their lungworm infections. The survivors were kept for tests on acquired resistance. Death or survival appeared to be determined more by the number of larvae in the initial dose rather than by the total given: survival appeared to be the rule if 20,000 or fewer larvae were given in single or divided doses. All the animals were susceptible to infection and mature or nearly mature worms developed in all animals that lived three weeks or longer. The presence of some microscopic forms three to four weeks after infection with a single dose of larvae indicated either a natural or rapidly acquired resistance. The prepatent period varied from 21 to 30 days and the patent period 27 to 72 days. There appeared to be no clear relation between the length of prepatent period or patent period and the age of the host, the number of larvae given or the administration of single versus divided doses. Coughing râles, polypnea, pulmonary emphysema, expiratory grunt, pyrexia, dehydration, anorexia, diarrhoea and constipation were observed in the infected animals. However, neither the rapidity of onset nor the severity of the clinical signs was proportionate to the number of larvae administered. A marked weight loss preceded death in seven fatal cases, while animals with sublethal infections had poor weight gains. Interstitial and subpleural emphysema were constant findings at necropsy but the degree of pneumonia involvement varied. Histopathological findings were suggestive of bronchopneumonia. Rubin & Lucker point out that the presence of microscopic larvae in lungs of calves three to four weeks after initial infection, in which the cause of death cannot be diagnosed by ordinary methods of examination of the lungs at necropsy, should alert workers investigating the aetiology of pneumonic disease in cattle in the field to the possibility of a “fatal larval lungworm disease”. It was suggested that a single initially infected calf can contaminate a pasture with as many as 33,000,000 larvae. D.L.H.R.

(51c) Allen & Oldfield tested the efficiency of phenothiazine on feeder lambs brought in from pasture in Oregon, grazed by sheep for many years, and on which no definite parasite control had been in effect. Forty lambs were grouped at random into four lots of ten each and half of each lot was drenched twice with 25 gm. of phenothiazine suspension N.F., the

second drench being administered two weeks after the first. The treated lambs appeared in better condition throughout the experiment and the average weight gain was 13.6 lb. per lamb in treated animals as opposed to 3.1 lb. per lamb in untreated animals. Parasite loads were considerably lower in the treated groups and the carcass grades were considerably higher. Nematodes encountered in the abomasum were *Ostertagia circumcincta*, *Haemonchus contortus* and *Trichostrongylus axei*, *Ostertagia* spp. being the most prevalent. Intestinal worms found were *Trichostrongylus colubriformis*, *T. vitrinus*, *Cooperia curticei*, and *Bunostomum trigonocephalum*.
D.L.H.R.

(51d) Threlkeld, Price & Linkous investigated the relationship of cobalt deficiency to internal parasites of sheep. Sixteen lambs were weaned and placed on a cobalt deficient diet within one week after birth and upon the manifestation of cobalt deficient symptoms were separated into four physiologically similar groups. Group 1 received a basal ration plus 1 mg. of cobalt twice weekly for the first two weeks then 1 mg. of cobalt per week until the experiment ceased. Group 2 were fed on the same basal ration and cobalt as group 1 but were given orally 70,000 larvae comprising approximately 90% *Haemonchus contortus*, 5% *Ostertagia circumcincta* and 5% *Trichostrongylus axei*. Group 3 received the same basal ration without cobalt and were infected with similar numbers of parasites as in group 2. Group 4 received the basal ration alone. Necropsies were performed on all animals. Group 1 responded well to the weekly administration of cobalt but in group 4 cobalt deficiency was manifested in the later weeks by the loss in weight, precipitous drop in haemoglobin and haematocrit readings and an average cobalt level of 0.059 p.p.m. in the liver. Infected animals which had received cobalt (group 2) had more *H. contortus*, more of the females were gravid at the same post-infection interval, and a higher percentage of the females had linguiform processes; the average length of the females was also greater. More cobalt was also found in the worms recovered from the cobalt fed lambs than from the lambs fed the basal ration only. From these results Threlkeld, Price & Linkous conclude that the ability of *H. contortus* larvae to establish themselves within the host animal appears to be dependent upon the presence of cobalt in the diet of the host animal.
D.L.H.R.

(51e) Shumard *et al.* investigated the effects of trace minerals (as trace mineralized salts NaCl 96.0%, Fe 0.30%, Mn 0.150%, Co 0.010%, Cu 0.060%, I 0.007%), dicalcium phosphate, phenothiazine and combinations of these on the resistance of lambs to *Haemonchus contortus* and other nematodes. 24 days prior to infection of the lambs with 20,000 infective larvae, the ewes were drenched with 4 oz. of aqueous solution containing 1.5 oz. of phenothiazine, and given a capsule of lead arsenate, and feeding of salt rations began. The worm counts, the numbers of worms recovered at necropsy and haemoglobin concentrations of infected lambs suggested that the phenothiazine trace mineral dicalcium phosphate combination was superior to any of these alone. Lambs receiving trace mineralized salt without dicalcium phosphate or phenothiazine were most severely affected by the nematode infections and the addition of dicalcium phosphate to the diet containing trace mineralized salt produced an added resistance.
D.L.H.R.

(51f) Bell investigated the effect of continuous phenothiazine therapy on dogs artificially infected with *Ancylostoma caninum*. Dogs receiving up to 132 mg. per kg. body-weight per day appeared to be in normal health but at a daily dose level of 198 mg. per kg. body-weight there was a marked decrease in the blood values, the animals lost weight, appeared sluggish, dehydrated, and showed partial anorexia, and on necropsy the dog receiving 198 mg. per kg. showed toxic hepatitis, nephritis, swollen lymph nodes and cachexia. A daily dose of up to 66 mg. per kg. body-weight per day for 60 days produced no significant effect on normal healthy dogs. Treated dogs showed a reduction in the ova per gramme count of the faeces, few ova that developed into viable larvae and a reduction in the number of larvae that developed into adults.
D.L.H.R.

(51g) Douglas, Baker & Longhurst investigated the relationship between particle size and anthelmintic activity of phenothiazine against lambs with natural worm infection and laboratory mice infected with *Nematospiroides dubius*. 25 gm. of "coarse", "medium" or "fine" phenothiazine was administered in hard gelatin capsules, to ensure that each lamb received a full dose. Both anthelmintic efficiency and suppression of ovogenesis was higher when the mean particle diameter was between 1μ and 2μ . At 50μ to 70μ diameter it was 70% effective but at 140μ diameter it was ineffective. Worms recovered at necropsy were *Ostertagia circumcincta*, *O. trifurcata*, *Trichostrongylus vitrinus*, *T. axei*, *T. colubriformis*, *Nematodirus filicollis* and *N. spathiger*. Phenothiazine incorporated in the diet of infected mice confirmed the observation on lambs.

D.L.H.

52—American Rose Annual.

- a. JENKINS, W. R., 1956.—"Nematodes as pests of roses." 41, 101-105.

(52a) This is a general article on the association between nematode parasites and decline of woody ornamental plants, especially roses. The symptoms of nematode decline are outlined. Nematodes associated with decline in roses are *Tylenchorhynchus* sp., *Helicotylenchus* sp. and *Xiphinema diversicaudatum*. Control methods are briefly discussed and it is pointed out that soil fumigation is only temporarily effective. Rose growers can alleviate the situation by sound fertilization, liberal watering and protection of their plants from other pests and diseases.

M.T.

53—Anais do Instituto de Medicina Tropical. Lisbon.

- a. CAMBOURNAC, F. J. C., GÂNDARA, A. F. & CASACA, V. R., 1956.—"Prospecção de endemias reinantes na área de Capelongo (Rio Cunene, Angola)." 13 (1/2), 5-15. [English & French summaries pp.14-15.]
 b. CAMBOURNAC, F. J. C. & CASACA, V. R., 1956.—"Prospecção de endemias reinantes na área de Mulondo (Rio Cunene, Angola)." 13 (1/2), 17-25. [English & French summaries p.25.]
 c. MORAIS, T. DE, 1956.—"As bilharzioses humanas na Zambézia (Moçambique)." 13 (1/2), 69-82. [English & French summaries pp.80-81.]
 d. OLIVEIRA LECUONA, M. DE, 1956.—"Nota prévia sobre a existência da oncocercose na Guiné Portuguesa. (Primeiro caso registado)." 13 (1/2), 83-85. [English & French summaries p.84.]
 e. OLIVEIRA LECUONA, M. DE, 1956.—"Primeiros ensaios sobre a existência da teníase na Guiné Portuguesa e ensaio terapêutico com a Camoquina." 13 (1/2), 87-96. [English & French summaries pp. 95-96.]

(53a) Examination of the urine of 500 Quipungo natives in the region around Capelongo in Angola showed that 13.8% had schistosome infection. Faecal examinations of 500 were positive for *Ancylostoma duodenale* in 318, *Strongyloides stercoralis* in five, *Trichuris trichiura* in one, *Hymenolepis nana* in three and *Taenia* sp. in two.

M.MC.

(53b) Of 1,000 Quipungo natives examined in the area around Mulondo, Angola, the urine was positive for schistosomiasis in 12.9%. In 1,000 natives, most of whom had been treated with carbon tetrachloride a few months before, faecal examination was positive for *Ancylostoma duodenale* in 399, *Strongyloides stercoralis* in two, *Enterobius vermicularis* in one, *Hymenolepis nana* in four and *Taenia* sp. in three.

M.MC.

(53c) In 1,800 natives in Zambezia, Mozambique, vesical infection with *Schistosoma haematobium* was present in 81.88%, intestinal infection with *S. haematobium* in 1.94% and with *S. mansoni* in 9.66%. In one case *S. mansoni* eggs were found in the urine.

M.MC.

(53d) Onchocerciasis is reported for the first time from Portuguese Guinea, in a cattle man who had not left the country for several years. He lived in Piche, near the river Coruba where he was often bitten by Simuliids. His sight had been worsening for two years. A nodule on the left shoulder blade contained *Onchocerca volvulus* but no microfilariae were found in the dermal lymph.

M.MC.

(53e) The Veterinary Service in Portuguese Guinea has known for some time that beef from the area of Gabú and especially from the administrative post of Piche is, to a large extent, unusable through *Cysticercus bovis* infection. Thirty-six out of 102 carcasses at Nova Lamego and five out of nine in Piche were rejected on this account. From questioning 9,134 natives in Piche, 601, mostly children, were considered to be carriers of *Taenia saginata*. Adults were probably less often infected because they treated themselves with aqueous extract of the roots of *Aframomum granu-paradisi*. 176 natives received Camoquin in a single dose of 0.2 gm. to 0.5 gm. according to age, up to 14 years, and 0.6 gm. after the age of 15. The tapeworms were passed within 48 hours but no scolices were seen. After three months, 119 out of 122 were still apparently free of infection and when 50 of them were treated with atebirin, only one passed proglottides.

M.MCK.

54—Annales de Médecine Vétérinaire.

- a. GRÉGOIRE, C., GRANVILLE, A., POUPLARD, L., DEBERDT, A., SPRENGERS, R. & VILLANYI, J., 1956.—“La cysticercose bovine. A.—Epidémiologie et diagnostic de la laderie.” 100 (1), 24–36.
- b. LIEGEOIS, F., 1956.—“La cysticercose bovine. B.—Quelques propos sur la législation et la jurisprudence commerciales en matière de laderie ou cysticercose bovine.” 100 (1), 37–48.

(54a) The authors discuss recent work on the epidemiology of cysticerciasis bovis and draw attention to the reports of differing predilection sites in various parts of the world. In Belgium they have found the following order of preference: (i) masseters, (ii) heart, (iii) oesophagus, (iv) tongue, (v) neck and (vi) shoulder. In their opinion the reported percentages of infection are too low and the incidence may be as high as 50%; incision of the oesophageal musculature, as well as the heart and masseters, should be compulsory in meat inspection. They outline the main prophylactic measures and consider that the public is not sufficiently informed of the danger of habitually eating raw meat.

S.W.

(54b) Liegeois discusses the legal claims which buyers of cattle have against the vendors when animals which are destined for sale as fresh meat are condemned after slaughter because of cysticercus infection. The Belgian legislation of 1894 is out of date and the legal text needs to be adapted to modern sterilization techniques, not only in the sense of providing a safeguard for the public health but also to protect the rights of the buyer.

S.W.

55—Annales de Parasitologie Humaine et Comparée.

- a. DOLLFUS, R. P., 1956.—“Système de la sous-classe des Aspidogastrea E. C. Faust et C. C. Tang 1936.” 31 (1/2), 11–13.
- b. FONSECA, F., FRAGA DE AZEVEDO, J. & MARQUES DA GAMA, M., 1956.—“Nouveaux cas humains de fasciolose hépatique au Portugal.” 31 (1/2), 14–22.
- c. CAMPANA-ROUGET, Y. & THÉODORIDES, J., 1956.—“A propos de *Angiostoma limacis* Dujardin 1845 (Nematoda, Angiostomatidae) parasite du tube digestif des limaces.” 31 (1/2), 23–28.
- d. CHABAUD, A. G., 1956.—“Essai de révision des physaloptères parasites de reptiles.” 31 (1/2), 29–52.
- e. CHABAUD, A. G. & ROUSSELOT, R., 1956.—“Sur quelques filaires d’Afrique Equatoriale.” 31 (1/2), 53–98.
- f. IYENGAR, R., 1956.—“Développement de *Wuchereria bancrofti* (Cobbold) et de *Wuchereria malayi* (Brug.) (1re partie).” 31 (1/2), 99–138.
- g. GOLVAN, Y. J., 1956.—“La rétractilité des microfilaires sanguicoles dans les gouttes épaisses, ses modalités et sa valeur diagnostique.” 31 (1/2), 139–146.
- h. DOLLFUS, R. P., 1956.—“*Distoma arenula* F. C. H. Creplin 1825, distome peu connu, trouvé chez la poule d’eau, *Gallinula chloropus* (L.) à Richelieu (Indre-et-Loire).” 31 (3), 182–188.
- i. DOLLFUS, R. P. & PATAY, R., 1956.—“A propos de nouvelles localités françaises pour *Codonocephalus urniger* (Rudolphi 1819) (Trematoda, Strigeidae). Que sait-on de sa distribution géographique?” 31 (3), 189–198.
- j. GOLVAN, Y. J., 1956.—“Acanthocéphales d’oiseaux. Première note. Description d’*Arhythmorhynchus longicollis* (Villot 1875) et révision du genre *Arhythmorhynchus* Lühe 1911 (*Acanthocephala*).” 31 (3), 199–224.

- k. GOLVAN, Y. J., 1956.—“Une espèce et une variété nouvelles d'acanthocéphales parasites des poissons de mer des côtes du Sénégal, et redescription de *Serrasentis socialis* (Leidy 1851).” *Van Cleave* 1924.” **31** (3), 225–241.
- l. CHABAUD, A. G. & ROUSSELOT, R., 1956.—“Description d'un nouvel acuariide d'Afrique Equatoriale: *Schistogendra incisa* n.gen., n.sp.” **31** (3), 242–247.
- m. CHABAUD, A. G. & ROUSSELOT, R., 1956.—“*Pygarginema africana* n.sp. (Nematoda, Ascaropsinae), parasite d'un céphalophe africain.” **31** (3), 248–254.
- n. CHABAUD, A. G. & ROUSSELOT, R., 1956.—“Deux nouveaux *Rictularia* (Nematoda, Thelaziidae) d'Afrique Equatoriale.” **31** (3), 255–265.
- o. IYENGAR, R., 1956.—“Développement de *Wuchereria bancrofti* (Cobbold) et de *Wuchereria malayi* (Brug). (IIe partie).” **31** (3), 266–287.
- p. CAMPANA-ROUGET, Y., 1956.—“Sur un nouveau subuluride de l'écureuil, *Xerus rutilus* (Cretzschm. 1826).” **31** (3), 288–299.
- q. PETTER, F., 1956.—“Invagination intestinale multiple déterminée par la présence d'un nématode chez un écureuil terrestre d'Afrique occidentale française, *Xerus erythropus* (Geoffroy).” **31** (3), 300–301.
- r. CHABAUD, A. G. & CAMPANA-ROUGET, Y., 1956.—“Le genre *Ortleppina* Schulz 1927, parasite d'apodes, et non de serpents, est synonyme du genre *Heliconema* Travassos 1919.” **31** (3), 308–309.
- s. CHABAUD, A. G., 1956.—“Structure céphalique de *Gendria tilapiae* Baylis 1930.” **31** (3), 310–311.

(55a) Dollfus recognizes two families in the Aspidogastrea, viz., the Aspidogastridae Poche, 1907 (emended), which are forms less than 20 mm. long, having a single ventral adhesive organ, composed of alveoli lying one next to the other in one or several longitudinal rows; and the Stichocotylidae Faust & Tang, 1936, which are longer forms having independent suckers spaced longitudinally on the ventral surface. He gives a key to the genera of Aspidogastrea and eliminates *Zonocotyle* and *Aspidocotyle* as Digenea. In a footnote, Dollfus points out that *Multicalyx*, a synonym of *Macraspis*, was created as a subgenus of *Stichocotyle* and was raised to generic rank by Skryabin in 1952. M.MCK.

(55c) *Angiostoma limacis* Dujardin, 1845 is redescribed and figured from the slug *Arion rufus*. The genus *Limaconema* Mengert, 1953 is suppressed under the law of priority. Following Chitwood & Chitwood, 1950, *Angiostoma* is retained in the Rhabditoidea. M.MCK.

(55d) Maintaining that speciation in the physalopterids of reptiles reflects geographical as much as host distribution, Chabaud retains 36 species and arranges and figures them in seven basic groups according to their head denticulation. One group, for *Skrjabinoptera*, is characterized by a single interno-lateral tooth on each side. Five groups, for the species of *Abbreviata*, are those having variations on the pattern of one externo-lateral, one interno-lateral and two double sub-median teeth on each side. One group, for *Physaloptera*, is characterized by one externo-lateral and three interno-lateral teeth per side but no sub-median teeth. *A. algeriensis* nom.nov. is proposed for the nematodes identified by Seurat in 1914 as *P. paradoxa* and later made synonymous with *P. varani* by him. *A. baylisi* nom.nov. represents those worms from *Varanus exanthematicus* with the head structure of *P. paradoxa* but with a dichotomous division of the uterus. It comprises the specimens tentatively identified as *P. quadrovaria* by Baylis & Daubney (1923), those classified as *P. paradoxa* by Kung (1948) and Chabaud's present material. M.MCK.

(55e) The following filariids were recovered at Brazzaville Zoo from wild animals, mostly from the Congo, and from domesticated animals slaughtered at the abattoirs of Brazzaville and Bangui. *Filaria cephalophi* n.sp., based on two females from the bay duiker, *Cephalophus dorsalis castaneus*, is the first *Filaria* s.str. reported from an ungulate. It resembles *F. martis*. The oesophagus is 31 mm. long and the unpaired part of the ovejector measures 18 mm. The presence of a thick-walled and ring-like buccal capsule removes the difference between *Filaria* and *Hyracofilaria* Ortlepp [not Mönnig], 1937. Consequently *Hyracofilaria hyracis* becomes *Filaria hyracis* n.comb. In *Setaria longicauda* n.sp. from the antelope *Adenota kob*, from Archambault, Lake Chad, the male is like that redescribed by Baylis (1932) as *S. pillersi*, but the female differs from Thwaite's original description in having a longer

tail (750μ) and rectangular teeth. *S. dipetalonematoide* n.sp., found in the inter-muscular connective tissue of the antelope, *Guevei* (*Philantomba*) *coeruleus*, resembles *S. southwelli* and *S. cornuta* sensu Boulenger, 1928 but the peribuccal ring does not project from the surface of the head and the teeth are closer together. *Diplotriciaena halcyoni* n.sp. from the kingfisher *Halcyon leucocephala pallidiventris* is distinguished from other species parasitic in the Coraciiformes by the crescent-shaped markings at the mid-level of the trident, the clear division of the glandular and muscular oesophagus and the arrangement of the cloacal papillae, of which there are four pairs on the posterior margin of the body, one being pre-cloacal, and three or four, more ventral irregular pairs, of which one or two are pre-cloacal. *Striatofilaria pelecani* n.sp., apparently the first filariid known from a pelican, is described from fragments in *Pelecanus rufescens*. The male tail resembles that of *Paronchocerca*, now assimilated into *Striatofilaria* (Chabaud & Campana-Rouget, in the press), but the spicules are very small, measuring 60μ and 80μ . *Setaria cervi* is reported from domestic cattle and *S. leichnungwingi* is considered synonymous with it. As *Dirofilaria corynodes*, found in *Cercopithecus cephus cephus*, resembles *D. schoutedeni* in the ventral ornamentation on the posterior end of the male, the arrangement of the cloacal papillae and the body-length, and is similar to *D. aethiops* in the structure of the spicules and the anterior position of the vulva, the latter species are both made synonymous with *D. corynodes*. The microfilariae found in the female of *D. corynodes* may have been overlooked originally by von Linstow. His measurements of the body-lengths tally reasonably with those of the present material, but his widths of 114μ and 97μ , compared with 520μ and 350μ now recorded, probably reflect an error in his scale. *D. kuelzii* in *Cephalophus dorsalis castaneus* has eight salient cephalic papillae and two amphids, the oesophagus is entirely muscular and the excretory pore is far behind the nerve ring. Individual variation and the difficulty of locating the cloacal papillae and, in the female, the anus, suggest that the *Dirofilaria* species of *Cephalophus* are best considered as one; thus *D. symmetrica* becomes synonymous with *D. kuelzii*. Other species recovered were *Hastospiculum macrophallos* from *Varanus niloticus*; *Onchocerca armillata*, reported from the Congo for the first time, in domestic cattle; *Setaria hornbyi* in *Cephalophus dorsalis castaneus*, *C. nigrifrons nigrifrons* and *Ourebia ourebi dorcas* (the latter from Oubangui); *Pharyngosteraria ardeae*, found in the pericardial cavity and intestinal wall of the heron *Ardea* (*Pyrhrherodia*) *purpurea*; and *Dipetalonema vanhoofi* in *Pan troglodytes troglodytes*.

M.MCK.

(55f) In this, the first part of his paper, Iyengar makes a detailed comparison of the microfilariae of *Wuchereria bancrofti* and *W. malayi* from fresh smears and permanent preparations and in mosquitoes by serial section and dissection. He deals with the differentiation of the two microfilariae and describes and illustrates the development of *W. bancrofti* in *Culex fatigans*. After ingestion, the microfilariae lose their sheaths when piercing the intestine to reach the perivisceral space and then settle in the vertical or longitudinal thoracic muscles. Gaining nourishment through the cuticle only, they develop in three stages which are independent of age and separated by moults. Differentiation occurs in the first stage. Of the four cells lined in front of the anal pore, two give rise to the middle intestine, one to the posterior intestine and one to the genital primordium. The oesophagus develops from cells behind and in front of the excretory cell. The second-stage larva lengthens and often doubles back on itself. It may be encapsulated by host cuticle in these two stages and perish. The third-stage larva further elongates and becomes motile, attaining the head and labium. The internal central body in the microfilaria soon disintegrates and is probably a food store. In isotonic solution, infective larvae did not penetrate intact, scarified or delicately pierced human skin.

M.MCK.

(55g) To study the shrinkage of microfilariae in thick blood smears, Golvan stained new and very old smears using variations of the Giemsa technique. In thick smears, the microfilariae of *Loa loa*, *Wuchereria malayi* and *W. bancrofti* var. *vauceli* have a shrunken appearance, whereas *W. bancrofti typica*, *W. bancrofti* var. *pacifica*, *Mansonella ozzardi* and *Dipetalonema perstans* do so only scarcely or not at all. Whatever the method of staining or

age of the smear, should the microfilariae of *W. bancrofti* become shorter, their width increases and this enables them to be identified. In the shrinkage of *L. loa*, *W. malayi* and *W. bancrofti* var. *vauceli* the nuclear column follows the windings of the cuticle whereas in *W. bancrofti* var. *typica*, *W. bancrofti* var. *pacifica* and *M. ozzardi* the nuclear column is twisted inside the wrinkled cuticle. Shrinkage does not impede the appreciation of their differential characters and even in thick smears 35 days old, the genital and excretory cells are easily stained. Golvan concludes that these various microfilariae can be identified under the worst conditions. M.Mc

(55h) *Distoma arenula* Creplin, 1825 was found in a new host, the moorhen *Gallinula chloropus*, at Richelieu and is redescribed. The excretory vesicle is intermediate in shape between a V and a Y; it reaches anteriorly to the hind border of the testes and fits posteriorly between the ends of the caeca. Dollfus considers that this species is best assigned to *Laterotrematidae* in which case it may require a new subgenus. M.Mc

(55i) Dollfus & Patay consider that *Codonocephalus urnigerus* (Rud.) are immature adults. These flukes were killing large numbers of *Rana esculenta* in Grande-Brière, St.-Joachim on the Lower Loire, and were found in the Vendée in the same host. They have been reported from Austria, Germany, Switzerland, Italy and southern Russia. Giving the number and location of *C. urnigerus* cysts found in 15 out of 20 frogs from Grande-Brière, Van der Driessche (in an additional note) reports a maximum of 92 cysts in one frog. M.Mc

(55j) Golvan describes in detail the morphology of *Arhythmorhynchus longicollis* from *Larus ridibundus* on the coast of Brittany. He lists under the continents of origin the species of *Arhythmorhynchus* recorded to date and discusses those from Europe. Of these, he recognizes only *A. frassoni* and *A. longicollis*. Synonymous with *A. frassoni* are *A. roseus* and *Echinorhynchus* (sensu lato) *rubicundus*; while *A. invaginabilis*, *A. macrourus* and *A. ananias* are synonymous with *A. longicollis*, *A. invaginabilis suecicus* being a variety of it. Golvan confirms that *A. siluricola* belongs to the genus and gives a modified diagnosis of *Arhythmorhynchus*, a key to world species and a host list for 15 of them. M.Mc

(55k) The autopsy of 73 fishes from the coast of Senegal revealed Acanthocephala of six species in the 38 different hosts, nearly all of which were new host records. *Gorgorhynchus robertdollfusi* n.sp., represented by three immature females in *Gempylus serpens*, has, in comparison with other *Gorgorhynchus* species, a shorter proboscis with only 18 longitudinal rows of hooks and only 10-12 hooks per row, and has cuticular folds covering the body spines almost to their tips. In *Illiosentis furcatus africana* n.var. from *Albula vulpes*, the large proboscis hooks averaged 0.124 mm. in length, whereas in the type species they measure 0.051-0.089 mm. and the hooks in the circle in front of them were unusually big. The size and colour of *Rhadinorhynchus pristis* varied considerably but the size was constant for a given host, irrespective of host size, number of parasites, etc. The finding of *I. furcatus*, *Acanthocephaloideus propinquus* and *A. chabanaudi* extends their known geographical range. *Serrasentis socialis* was not found in association with other Acanthocephala, although it was frequently encountered. Golvan redescribes the mature adult of *S. socialis* from *Elacate nigra*. The adult has apparently only been recorded once previously, by Linton, from the same host. The original diagnosis is modified to read: body 130 mm. to 70 mm. long in the females, 70 mm. to 25 mm. in the males; 18 to 28 cuticular combs. M.Mc

(55l) From a kingfisher, *Halcyon senegalensis*, from the middle Congo, which died at Brazzaville Zoo, Chabaud & Rousselot describe and figure *Schistogendra incisa* n.g., n.s. Behind two deeply cut and complex pseudo-labia there are one dorsal and one ventral pair of smooth cuticular plaques recalling the structures of *Rusguniella*, *Schistorophus* and *Tetrastomatella*. The cephalic arrangement somewhat resembles that of Spiruridae but the genus belongs to Schistorophinae in the Acuariidae. M.Mc

(55m) *Pygarginema cervi* Lubimov, 1953 is synonymous with *P. skrjabini*. Both species, recorded from Russia, may be identical with *P. verrucosa* from Brazil. Chabaud & Rousselot describe and provisionally name *P. africana* n.sp. another very similar nematode from a bay duiker, *Cephalophus dorsalis castaneus*, captured in the middle Congo and which died at Brazzaville Zoo. They propose to differentiate *P. skrjabini*, *P. verrucosa* and *P. africana* on the host and locality, the body length, nature of the spicules and position of the large post-cloacal papillae. Comparative study might validate these three species since they are, geographically, so far apart. M.MCK.

(55n) Two new species of *Rictularia* were recovered at the Brazzaville Zoo from mammals from the middle Congo. *R. desportesi* n.sp. is described from a female in *Lophuromys sikapusi*. The mouth and related structures are displaced dorsally, the internal cephalic papillae are larger than the external and the vulva is just anterior to the hind end of the oesophagus. The related species *R. harrisi* and *R. taterilli* are larger and the mouth is displaced more dorsally; in *R. caucasica* the mouth is much more dorsal and the eggs are considerably bigger; *R. ondatrae* and *R. jaegerskioldi* have a more symmetrical buccal capsule and *R. dipodomis* has the mouth more apical and the vulva further back. *R. dollfusi* n.sp., represented by two females from *Nandinia binotata*, is distinguished chiefly by the remarkable internal cephalic papillae of which the two dorsal papillae are roughly E-shaped; the lateral and, especially, the ventral papillae and the amphids are modified into chitinous and more or less fused cordons meandering ventrally about the mouth. The species measures 72-83 mm., has paired ovaries and an apical mouth. To the *Rictularia* which were reviewed by Dollfus & Desportes (1945), Chabaud & Rousselot now add *R. nana* Caballero, 1943 (probably a synonym of *R. macdonaldi*), *R. nycticebi*, *R. oligopectinata*, *R. ondatrae* and *R. onychomis*, which were overlooked, and the species reported since, viz., *R. dipodomis*, *R. microti*, *R. baicalensis*, the *Rictularia* sp. of Harwood & Cooke (1949) and the *Rictularia* sp. of Lindquist & Li (1955) which is similar to *R. tani*. M.MCK.

(55o) Continuing his paper [see No. 55f above] on the development of *Wuchereria bancrofti* and *W. malayi* in their mosquito vectors, Iyengar devotes this concluding section to the histology of each of the three larval stages of *W. malayi* in *Mansonia (Mansonioides) annulifera*. He notes that the two nuclei characteristically present near the tip of the tail of the microfilaria of *W. malayi* slough with the first ecdysis. M.MCK.

(55p) *Oxynema bioccai* n.sp. from the ground-squirrel, *Xerus rutilus*, in Somaliland, is compared with *O. boueti* recovered from two specimens of *X. erythropus*, one from Niafounké, on the Niger, and the other from Senegal. The new species differs chiefly in having at the lower end of the right spicule a triangular expansion with a spatular enlargement at the tip, and in the position of the papillae on the external edge of the longitudinal striations of the caudal sucker, as opposed to the internal edge in *O. boueti*. The mouth is hexagonal without lips in both species. *O. bioccai* is larger than *O. crassispiculum*, the female tail is shorter, the male tail has a blunter point and the right spicule is different. It may be the same as the incompletely described *O. typicum* Kreis, 1940, but is distinctly larger and the first pair of pre-anal papillae seem to be differently placed. Details and measurements of eight species of *Oxynema* are tabulated. In a review of the Subulurinae, *Maupasina* and *Leipoanema* are removed from the subfamily. That *Oxynema* is distinct from *Subulura* is confirmed; it is characterized by the poor chitinization of the left spicule, the presence of chain-like markings on the rim of the caudal sucker and, less regular in form, on the post-cloacal lip. Campana-Rouget is of the opinion that *Parasubulura gerardi*, *P. petrodromi* and *P. callosa* should be retained in *Parasubulura*. This annuls *Heterobulura*, created by Skryabin & Shikhobalova for *P. callosa*, leaving only *Parasubulura* in the Parasubulurinae Inglis, 1955. This subfamily is therefore rejected. Numidicinae López-Neyra, 1945 is abolished as it now contains only *Oxynema*. A key is given for *Subulura*, *Oxynema*, *Aulonocephalus* and *Parasubulura*, the genera of the Subulurinae. M.MCK.

(55r) Chabaud & Campana-Rouget recognize *Ortleppina* Schulz, 1927 as a synonym of *Heliconema* Travassos, 1919. Probably this synonymy has been overlooked because the type species of *Ortleppina* (= *Physaloptera longissima* Ortlepp, 1922) was recorded as parasitic in "Snakes, Australia", whereas the species of *Heliconema* have always been found in apodemes. The subsequent finding of *Ortleppina longissima* in these fish indicates that the original host must have been apodes and not snakes. M.MCH

(55s) An apical view of the head of a specimen of Quimperiidae is, apparently, not known except for *Buckleynema*. Chabaud now describes this from one of the female co-type specimens of *Gendria tilapiae*. The border surrounding the mouth is almost circular and without lips, recalling that of some Subulurinae and *Seuratum*. Outwards from the amphistome there are four large and simple submedian papillae and two smaller lateral ones which probably represent the external ventro-lateral papillae. This head structure suggests that the Quimperiidae belong to the Ascaridioidea and not to the Spirurida. M.MCH

56—Annals of Applied Biology.

- a. ELLENBY, C., 1956.—"The cyst of the potato-root eelworm (*Heterodera rostochiensis* Wollenweber) as a hatching unit." 44 (1), 1-15.
- b. GOODEY, J. B., 1956.—"The susceptibility of potato varieties to infestation by the eelworm *Ditylenchus destructor* and *D. dipsaci*." 44 (1), 16-24.
- c. JONES, F. G. W., 1956.—"Soil populations of beet eelworm (*Heterodera schachtii* Schm.) in relation to cropping. II. Microplot and field plot results." 44 (1), 25-56.
- d. WALLACE, H. R., 1956.—"Soil aeration and the emergence of larvae from cysts of the beet eelworm, *Heterodera schachtii* Schm." 44 (1), 57-66.

(56a) Total emergence of *Heterodera rostochiensis* larvae was greater from halved cysts than from whole, and greater from trypsin-treated half cysts than from untreated. The enzyme may affect the egg-shell and/or the cyst wall. Total emergence from trypsin-treated whole cysts did not differ from that of untreated cysts although emergence began sooner. Halving cysts also led to earlier emergence. Some of the variability in emergence from the cyst, like the limitation of total emergence, may be bound up with the fact that the cyst is a more or less closed system. In one experiment on the hatching of free eggs more hatching occurred among the free eggs than among those still in a half cyst. In a second experiment there was no difference. It is suggested that limiting factors may operate among eggs in the mass even when they are not completely enclosed. J.B.

(56b) Twenty-five varieties of potato in common commercial practice were found to be susceptible to tuber attack by potato-derived populations of *Ditylenchus destructor* under field and pot experimental conditions. Stunting and leaf deformation may also be caused by the eelworms but appear less consistently. A race of *D. destructor* from mushroom spawn had almost no effect on potatoes. Various races of *D. dipsaci* can reproduce in the shoot tissue of potato, sometimes causing damage. One population of stem eelworm caused lesions on the tubers. J.B.

(56c) In soil population experiments, microplots were used to overcome some of the difficulties experienced with field plots. Cruciferae caused greater increases in beet eelworm populations than Chenopodiaceae when the initial population was low, and greater decreases when it was high. When sugar-beet was grown at varying initial populations, the final population tended to rise to a "ceiling" which varied with soil and season. A linear relationship was found to exist between the yield of sugar-beet and the logarithm of the initial eelworm population. Cruciferae were far less susceptible to injury by root invasion than the cultivated varieties of *Beta vulgaris* L. Host efficiency in raising and supporting eelworm populations and susceptibility to injury by invasion appear to be distinct and independent attributes of host plants. Decay of populations under fallow or non-host crops in non-host families is approximately 20%, 40% and 50% per annum for cysts, cysts with contents and eggs respectively and appears to be largely independent of the initial level. The *in vitro* hatch of beet eelworm

cysts is influenced by previous cropping, low hatching being obtained in the winter and spring following increase on a suitable host. Population increase appears to be limited by intra-specific competition between larvae in rootlets. Development and decline of populations follows a course similar to that of other pests but with the time factor greatly extended. The differential effects of soil, season and host crop render set rotations ineffective as a measure of control once land has become generally infested; at this stage a system of advice based on soil sampling is desirable.

F.G.W.J.

(56d) The influence of moisture content, pore size, depth and oxygen consumption in the soil on the rate of larval emergence from cysts of the beet eelworm is described. The sintered glass funnel technique was used to control soil moisture and experiments showed that the rate of larval emergence increased with aeration. Wallace suggests that in field studies on larval emergence, due regard should be paid to soil structure as well as soil texture. Results suggest that those factors associated with good soil tilth also favour high rates of larval emergence.

H.R.W.

57—Annals of Tropical Medicine and Parasitology.

- a. SHERIF, A. F., 1956.—“A new intradermal antigen for the diagnosis of schistosomiasis.” 50 (2), 105–112.
- b. RAPER, A. B. & DOCKERAY, G. C., 1956.—“*Coenurus* cysts in man: five cases from East Africa.” 50 (2), 121–128.
- c. BAER, J. G., 1956.—“The taxonomic position of *Taenia madagascariensis* Davaine, 1870, a tapeworm parasite of man and rodents.” 50 (2), 152–156.
- d. ONABAMIRO, S. D., 1956.—“The early stages of the development of *Dracunculus medinensis* (Linnaeus) in the mammalian host.” 50 (2), 157–166.

(57a) Sherif describes the technique by which he prepared an antigen from miracidia of *Schistosoma haematobium* and a small proportion of *S. mansoni*. He used it in intradermal tests on 1,200 individuals divided into five groups: (i) 470 known to have active schistosomiasis, (ii) 250 without parasitic infections but in some cases with allergic conditions, (iii) 224 free of schistosomiasis but infected with intestinal nematodes, cestodes and protozoa, (iv) 206 patients who had been treated for schistosomiasis with antimony compounds one month to three years previously and (v) 50 infected patients undergoing treatment at the time of the test. The appearance of a wheal at least 10 mm. in diameter and surrounded by an erythematous flare within 20 minutes was considered to be a positive reaction. All the patients in group (i) gave a positive reaction and all were negative in groups (ii) and (iii); in group (iv) those treated more than six months previously were negative to the miracidial antigen although positive to *Fasciola*, *S. bovis* and schistosome cercarial antigens; in group (v) all gave positive reactions before treatment and at the time of greatest concentration of antimony in the blood; at this time erythematous flare around the wheals was more marked, possibly due to host sensitization by mass destruction of the adult schistosomes.

S.W.

(57c) Baer has re-examined specimens identified by Adams & Webb in 1934 as *Davainea madagascariensis* (?) and finds them to be identical with *Inermicapsifer arvicanthidis*. He discusses the history of this species, which has so far been assigned to two genera and described under six different names and, since *madagascariensis* has priority over *arvicanthidis*, proposes that it should become *Inermicapsifer madagascariensis* n.comb. with 12 synonyms which are listed.

S.W.

(57d) Onabamiro has completed experimentally the life-cycle of *Dracunculus medinensis* in two Nigerian species of cyclops and in dogs. Gravid female worms were recovered after about a year. Mature males and females were recovered after three to four months; the females had mucus plugs in the vaginae indicating that fertilization had occurred; the males, however, showed no atrophy and were still in close contact with the females, suggesting that it had only taken place a very short time previously. The youngest worms which could be found were 43 days old, diligent searching for earlier infections having failed. Males and

females 43 to 48 days old were present in the subcutaneous tissues and there is some indication that they reached there from the gut via the lymphatic system. Some were undergoing their fourth moult. The sexes were present in approximately equal numbers but the males had not developed spicules. The morphology is described and illustrated by photomicrographs. A table sets out the number, sex and location in the host of the worms recovered at different intervals. Males showed no tendency to migrate down the limbs. S.W.

58—Archives des Maladies Professionnelles, de Médecine du Travail et de Sécurité Sociale.

- a. NUNZIANTE CESÀRO, A., GRANATA, A. & SAITTA, G., 1956.—“Analyse cytochimique du sang périphérique dans l'ankylostomiase. Observations sur le comportement cytochimique des granulocytes éosinophiles.” 17 (1), 19-24.

(58a) The cells in blood smears of 12 patients with ancylostomiasis reacted normally to stains demonstrating lipids, polysaccharides, ribonucleotides, desoxyribonucleotides, peroxidase, oxidase, and acid and alkaline phosphatase. The cytoplasm contained alkaline phosphatase mostly, whereas acid phosphatase was present chiefly in the nuclei. The eosinophil granules could only be coloured by stains which demonstrated both acid and alkaline phosphatases. M.MCK

59—Archivio Italiano di Scienze Mediche Tropicali e di Parassitologia.

- a. LIPPI, M., 1956.—“Ulteriore contributo della terapia dell'anchilostomiasi con associazione di etilresorcinolo e tetracloroetilene per instillazione duodenale.” 37 (2), 57-59.
- b. LIPPI, M. & SEBASTIANI, A., 1956.—“Le granulazioni tossiche dei leucociti neutrofili nelle parassitosi intestinali.” 37 (2), 60-65.
- c. PICARO, A., 1956.—“Due casi di cisti da echinococco retroperitoneale.” 37 (2), 86-89.
- d. SCALABRINO, F., 1956.—“Le echinococcosi secondarie a localizzazioni scheletriche.” 37 (2), 98-108.
- e. SCOTTI, G., 1956.—“Cenni storici sulla imenolepiasi.” 37 (3), 127-131.
- f. EGIDIO, M. DI, 1956.—“Quadri radiologici della bilharziosi urinaria nello Yemen.” 37 (4), 165-185. [English, French & German summaries pp. 183-184.]
- g. RIZZOTTI, G., 1956.—“Ricerche sull'etiologia delle eosinofilie di grado elevato in Etiopia.” 37 (4), 186-210. [English, French, & German summaries pp. 208-209.]
- h. MACCIOTTA, A. & ARTIZZU, M., 1956.—“Su un caso di intensa ascariidiasi a rapido esito mortale, in quadro shockale, in bambino di 6 anni.” 37 (4), 211-225. [English, French & German summaries pp. 223-224.]

(59a) By intubation with a hexylresorcinol-tetrachlorethylene mixture, Lippi cured four ancylostomiasis patients, including one who had received the dosage orally without result. M.MCK

(59b) Schilling's “toxic granulations”, revealed in abnormal neutrophils by the ordinary stains, were found by the May-Grunwald-Giemsa, Freyfeld and Mommsen stain techniques in 10 out of 14 patients with intestinal helminths and who had no other inferable disturbances. M.MCK

(59e) In a historical review, Scotti enumerates the contributions made chiefly by Italian workers in elucidating our knowledge on *Hymenolepis nana*. There are no references. M.MCK

(59f) Cases of vesical schistomiasis in the Yemen are illustrated by X-ray photographs. In 142 radiological examinations ten showed extensive calcification of the bladder and there were 56 with renal, urethral, or vesical calculi and 12 with hydronephrosis. R.T.L.

(59g) The eosinophilia frequently present in Ethiopia is attributed to *Strongyloides stercoralis* infection. In 10 out of 49 cases with an eosinophilia of over 20% huge numbers of this parasite were obtained by duodenal catheter, although few or none were found in the faeces. The worms were more numerous in the samples taken after the introduction of magnesium sulphate. R.T.L.

60—Australian Veterinary Journal.

- a. WHITLOCK, H. V., 1956.—“An improved method for the culture of nematode larvae in sheep faeces.” 32 (6), 141–143.

(60a) A method of obtaining infective nematode larvae from sheep faeces is described. The faeces are cultured in a tube surrounded by water in a closed jar. The infective larvae migrate up the sides of the tube and pass over into the surrounding water in which they are trapped. Regulation of the moisture content is automatic. The “continuous” recovery of larvae gives higher yields and the larvae are free from faecal debris. D.M.

61—Berliner und Münchener Tierärztliche Wochenschrift.

- a. HJÄRRE, A., 1956.—“Die Anthropozoonosen.” 69 (10), 181–185. [English summary p. 185.]
 b. LIEBMANN, H. & BOCH, J., 1956.—“Landwirtschaftliche Abwasserwertung und Verwertung der Haustiere.” 69 (11), 208–211.
 c. BOCH, J., 1956.—“Versuche zur Bekämpfung der Magen-Darmparasiten des Rotwildes mit Helmucidan.” 69 (16), 312–314. [English summary p. 314.]
 d. ENIGK, K. & MARKWARDT, M., 1956.—“Die Behandlung der latenten Helmintheninvasionen bei Schwein und Huhn.” 69 (18), 347–350. [English summary p. 350.]

(61a) The only items of helminthological interest in this review of diseases transmissible between animals and man are a brief reference to the occurrence of hydatid in Laplanders and reindeer because of close contact with dogs, and a short paragraph on the need to control *Trichinella* in fur-bearing animals: 5% to 6% of foxes and nutria in some parts of Sweden are said to harbour *Trichinella* and may be an indirect source of human infection. A.E.F.

(61b) Liebmann & Boch report on a survey, based on nearly two thousand faecal examinations, of helminthic infections in cattle maintained on sewage-irrigated land. In comparison with cattle in two other areas liver-fluke and *Moniezia* infection ran roughly parallel, but stomach worms showed a higher incidence in the sewage area (69%) than in the non-sewage areas (55% and 52%). The authors do not however consider that irrigation with sewage necessarily increases the incidence of helminths in domestic animals so long as proper precautions (e.g. two hours settling of sewage, the banning of pastures for cattle at least for 14 days after irrigation) are enforced. A.E.F.

(61c) About 600 red deer at 14 forest feeding places were experimentally treated during one winter for intestinal parasites with the phenothiazine-mineral mixture Helmucidan. 7 to 8 gm. of the powder per animal per day, added to the forage for 14 days with intervals of 20 days, stopped the elimination of eggs in the faeces, prevented massive reinfection of the forage places and also reduced the number of lungworm larvae passed. G.I.P.

(61d) The following substances are recommended for mass treatment. In pigs, cadmium anthranilate at the rate of 30 mg. per kg. body-weight for three days or a single dose of 300 mg. per kg. of piperazine adipate or citrate (given in food), fully removed ascaris. The citrate was also 50% effective against *Trichuris*, *Hyostromgylus* and *Oesophagostomum*. In chickens, 60 mg. per kg. of cadmium anthranilate, for three days in soft food, was fully effective against ascarids, while with piperazine citrate, as a 2% solution in drinking water for four days, 25% of the chickens retained a low infection. Evultin, given for three days in the doses of 1 mg. per kg. in food or 2 mg. per c.c. in drinking water, although not readily taken by the birds, was fully effective. G.I.P.

62—Bimonthly Bulletin. North Dakota Agricultural Experiment Station.

- a. BOLIN, F. M., SHUMARD, R. F. & EVELETH, D. F., 1956.—“Methods of controlling lung worms in swine.” 18 (3), 93–95.

(62a) From 1938 to 1955 lungworm in pigs had not been found in routine post-mortems in Minnesota or North Dakota but in Oct. 1955 two carcasses from a pig producer at Beltrami, Minnesota, showed heavy infections with *Metastrongylus apri* suggesting that this parasite

constituted a serious problem in his swine husbandry. As medication is of little or no value the advice given was to provide the pigs with adequate rations and to keep them on concrete or very dry lots in order to eliminate the earthworm vectors. The essential procedures in the McLean County system of swine sanitation are quoted. R.T.L.

63—Boletín Chileno de Parasitología.

- a. PIZZLI, T., 1956.—“Las reacciones intradérmicas en el diagnóstico de las enfermedades parasitarias.” 11 (1), 10-12. [English summary p. 10.]

(63a) The main causes of error in the intradermal diagnosis of parasitic infections are the use of ineffective or old antigen, poor technique, untrained personnel or an unusual response from the patient. Intradermal diagnosis is of relative value only and must be used with other evidence. In Bachman's technique for diagnosing trichinosis the early reaction is of value but in Casoni's technique for hydatid, only the late reaction counts. Suppuration of hydatid cysts reduces the percentage of positive results and the removal of the cyst does not alter the reaction. M.MCK.

64—British Medical Journal.

- a. BUDDEN, F. H., 1956.—“Onchocerciasis.” [Correspondence.] Year 1956, 1 (4976), 1171.
b. BARST, H. H., 1956.—“Operative procedure for hydatid disease of liver.” Year 1956, 2 (4978), 1280.

(64a) Whereas the principal effect of diethylcarbamazine (hetrazan) in onchocerciasis is to destroy the microfilariae that of suramin (antrypol) is to kill the adults. The former precipitates dermal and ocular lesions and the microfilariae reappear rapidly after treatment has ceased whereas the latter drug by killing the adults produces a permanent reduction in the number of microfilariae without causing marked exacerbation of the lesions. Mass denodulation would probably prove an ineffectual remedy as in a lightly infected region in Northern Nigeria only 36% of 386 individuals with positive skin snips have subcutaneous nodules. Where Simulium control is at present impracticable mass therapy with suramin under medical supervision is suggested. R.T.L.

(64b) Hydatid of the liver affects upwards of 50% of the population of a large area in the Eastern District of the Equatoria Province in Southern Sudan, of which Kapoeta is the principal town. A simple, safe and rapid operative procedure is described in which a Potain aspirating trocar and cannula, connected to a powerful suction apparatus, is forced through the thick adventitia of the hydatid cyst. The fluid is partially evacuated and strong formalin is injected through the side tube of the cannula. Two stay sutures are then inserted on each side of the cannula about 1.3 cm. away. After three to four minutes the suction tube is reconnected and the cyst is evacuated. It should now be completely flaccid and can be drawn up to and even outside the abdominal wall. The puncture in the cyst wall is enlarged and the collapsed germinal layer withdrawn. The adjacent edges of the peritoneum are sutured to the margins of the cyst leaving the cavity wide open. The sheath and the skin incisions are closed from below upwards with stainless steel wire, but the cyst cavity is left communicating with the outside. Following the operation 400,000 units of Procaine penicillin given twice daily for five days, will reduce infection and the patient should be fit for discharge in about eight to ten days with the sites of marsupialization completely closed. Supplementary details on technique are given for large cysts from which no fluid can be sucked out. R.T.L.

65—Bulletin de la Société de Pathologie Exotique.

- a. LAMY, L. & BÉNEX, J., 1956.—“Modification de technique de coproculture pour helminthes et protozoaires.” 49 (1), 43-44.
b. RADAODY-RALAROSY, P., 1956.—“A propos de l'éosinophilie tropicale essentielle: l'éosinophilie dans la bilharziose (cinq observations familiales).” 49 (1), 45-50. [Discussion pp. 50-51.]

- c. SCHWETZ, J., 1956.—“Sur l'immunité clinique dans les bilharzioses humaines.” 49 (1), 52-56.
- d. SCHWETZ, J., 1956.—“Sur quelques faits et principes fondamentaux de la bilharziose intestinale à *Schistosoma mansoni*.” 49 (1), 143-150.
- e. GRENIER, P. & OVAZZA, M., 1956.—“Contribution à l'étude des diptères vulnérants de l'Empire d'Ethiopie. II. Simuliidae. Simulies et onchocercose.” 49 (1), 182-196.
- f. ANDRÉ, J. & DESCHIENS, R., 1956.—“Incidence de la radio-activité d'une eau thermale (Plombières) sur des planorhines vecteurs des bilharzioses.” 49 (2), 277-281.
- g. DOLLFUS, R. P., 1956.—“Un hôte nouveau pour le cystique polycéphale de *Taenia (Multiceps) endothoracicus* Ja. D. Kirschenblatt, 1948.” 49 (2), 281-284.
- h. DESCHIENS, R. & BÉNEX, J., 1956.—“Hyperéosinophilie liée à une impasse parasitaire expérimentale de *Strongyloides fülleborni* chez le cobaye.” 49 (2), 285-292. [Discussion p. 292.]
- i. DESCHIENS, R. & BÉNEX, J., 1956.—“Syndrome de Löffler chez le cobaye dans la strongyloïdose expérimentale.” 49 (2), 293-296.
- j. SCHNEIDER, J. & HUSSON, R. A., 1956.—“Chimiothérapie des filarioses expérimentales. Résultats de recherches sur *D. blanci* et sur une filariose spontanée de cynocéphales d'Afrique Equatoriale. Action du T.W.Sb.” 49 (2), 296-300.
- k. JACOTOT, H., DESCHIENS, R., VALLÉE, A. & DEZEST, G., 1956.—“Splénite chronique dans un cas de filariose chez un cynocéphale.” 49 (2), 300-301.
- l. ROUSSELOT, R., 1956.—“Hépatite filarienne des anthropoïdes.” 49 (2), 301-303.
- m. THOORIS, G. C., 1956.—“Le traitement de la filariose à *Wuchereria bancrofti* par le thiocétarsamide de sodium en Océanie française.” 49 (2), 306-311.
- n. THOORIS, G. C., 1956.—“Le traitement expérimental de la filariose à *Wuchereria bancrofti* en Océanie française par la suramine (naphuride de sodium).” 49 (2), 311-317.
- o. THOORIS, G. C., 1956.—“Étude sur l'étiologie de la lymphangite aiguë dans la filariose à *Wuchereria bancrofti*.” 49 (2), 317-329.
- p. MARILL, F. G., 1956.—“Conditions d'aménagement des réseaux d'irrigation et prophylaxie de la bilharziose urinaire.” 49 (2), 373-378.
- q. DOLLFUS, R. P., 1956.—“Essai d'identification d'un échinostome immature d'une poule sultane, *Porphyryla alleni* (T.R.H. Thomson 1842) du Congo.” 49 (2), 379-387.
- r. CHABAUD, A. G. & MOUCHET, J., 1956.—“A propos d'un spiruride *Parabronema africanum* Baylis, 1921 présent dans le cœur et le foie d'un éléphant. Remarques sur la filiation des cycles évolutifs entre spirurides et filaires.” 49 (2), 388-397.

(65a) Lamy & Bénex have found that rabbit faeces make a satisfactory culture medium for hookworms and *Strongyloides* of man. The rabbit droppings are washed, broken up and spread to a depth of about 1 cm. in Petri dishes; these are then wrapped in filter paper, sterilized in an autoclave for 20 minutes at 120°C. and then kept in a refrigerator. When required a bean-sized piece of infected material is placed in the middle of the culture dish and mixed with the medium to a diameter of 3 or 4 cm. and the Petri dish kept, still wrapped in the paper in which it was autoclaved, at a temperature of 25°C. Addition of charcoal or potassium dichromate is unnecessary. s.w.

(65b) Radaody-Ralarosy has been able to observe for four years, ten patients belonging to the same family as a child whose condition had been diagnosed as true tropical eosinophilia. Of these ten, five showed a marked eosinophilia and in four of them eggs of *Schistosoma mansoni* were eventually found in the faeces although they remained negative for periods varying from 55 days to three years. He is of the opinion that true tropical eosinophilia is a myth and that repeated observations will almost always reveal a parasitic origin. In the discussion Deschiens agrees that non-parasitic tropical eosinophilia is rare but is not of the opinion that Weingarten's syndrome does not exist. Lavier points out that there is a tendency to confuse eosinophilia which occurs in the tropics with Weingarten's tropical eosinophilia which, in his opinion, is an unfortunate term as the syndrome has been observed at all latitudes; this syndrome may really exist but is very difficult to differentiate from Loeffler's syndrome and asthmatic conditions. s.w.

(65c) From his observations in four foci of schistosomiasis haematobia, Schwetz concludes that this is primarily a disease of children and young people and that the “acquired immunity” against schistosomiasis is in fact a state of premunition. Premunition is more clearly seen in urinary schistosomiasis than in intestinal schistosomiasis caused by *Schistosoma mansoni* or *S. intercalatum*. The relation of premunition to treatment is discussed briefly. s.w.

(65d) From his own and other published observations, Schwetz points out that the severity of the disease caused by *Schistosoma mansoni* is largely dependent on the local conditions; where the population is well fed, not continuously exposed to reinfection and is under medical supervision the disease is mild; on the other hand where the population is under-nourished, constantly exposed to reinfection and receives no treatment hepato-splenomegaly with ascites is common and the prognosis is grave. The term "intestinal schistosomiasis" should be completed by stating if it is caused by *S. mansoni* or *S. intercalatum*. In his opinion the assertion that *S. haematobium* infections may be rectal is erroneous; eggs of *S. haematobium* are only found in faeces of cases in foci of mixed infection and are the result of unusual migrations of one or two eggs. S.W.

(65e) Grenier & Ovazza record 15 species of *Simulium* in Ethiopia, and map their incidence and that of onchocerciasis, of which the principal vector is *S. damnosum*. R.T.L.

(65f) André & Deschiens have found that radio-activity of 17m μ c. per litre, in natural water from hot springs at Plombières does not kill *Australorbis glabratus*. The snails were also able to support a temperature of above 30°C. for at least 14 days and keeping them in darkness for 25 to 30 days did not affect their viability. S.W.

(65g) From an examination of polycephalous cysts from the abdominal and pleural cavities of *Meriones blackleri*, Dollfus concludes that they correspond with *Multiceps endothoracicus*. He briefly describes and illustrates these specimens. It is now evident that polycephalous cysts fall into two groups, the first with 40 to 44 hooks (of which the larger measure 340-416 μ and the smaller 220-256 μ) and which have been identified as *Taenia taeniaeformis*, *T. parva* and *T. laticollis*, and the second with 52 to 64 hooks (of which the larger measure 300-378 μ and the smaller 201-241 μ) and identified as *T. (Multiceps) endothoracicus*. S.W.

(65h) Deschiens & Bénex have investigated whether a parasitic infection in a state of "impasse", i.e. a parasite in an abnormal host in which it does not develop to maturity and reveal itself by faecal examinations etc., will cause eosinophilia. Six parasite-free guinea-pigs were inoculated with larvae of *Strongyloides fülleborni*. All developed a comparable wave of hypereosinophilia which started on the fourth day after infection and reached a maximum between the 10th and 20th days; it remained high for 10 to 15 days and then fell rapidly to normal or slightly above normal. At the peak there were 23 times as many eosinophils per cu.mm. of blood than before the infection. In the discussion Galliard compares these with similar results obtained in the dog, points out the danger of generalizing in the case of *S. stercoralis* which can complete its life-cycle in various hosts and draws attention to the recent discovery of *Wuchereria malayi* in monkey, dog and cat and the extreme eosinophilia which this filaria provokes in man. S.W.

(65i) Deschiens & Bénex have demonstrated experimentally that inoculation with larvae of *Strongyloides fülleborni* will cause Loeffler's syndrome in guinea-pigs. S.W.

(65j) Schneider & Husson describe the first results of chemotherapeutic tests of notezine, suramin and TWSb, using *Dipetalonema blanci* infections in *Meriones shawi lataste*. The two first mentioned showed little activity but injections of TWSb at various dose rates showed more promise, the most satisfactory being 25 mg. per kg. body-weight daily for six days. This dose was perfectly well tolerated, microfilariae disappeared from the peripheral blood and no adult worms were found post mortem. Monkeys (*Papio sphinx*) did not tolerate TWSb so well but a dose of 0.03 gm. per kg. daily for four days was satisfactory and caused the disappearance of microfilariae from the blood of 120 monkeys so treated. S.W.

(65l) Since first finding *Dipetalonema vanhoofi* in the blood vessels of the liver of a gorilla, Russelot has found them in the livers of five gorillas and 19 chimpanzees and has collected 200 worms, either whole or fragmented. Whole specimens were occasionally found in the large vessels, but more usually emerged from them when large pieces of liver were plunged into physiological saline at 40°C. Fragments were collected from the smaller vessels

by squeezing pieces of liver like a sponge. A small number were found in the intra- or extra-hepatic connective tissue. Infected livers were double the normal size and the consequences arising from the migrations of the larvae were serious. s.w.

(65m) Thooris has treated 35 cases of filariasis bancrofti (of which 21 showed clinical symptoms) with thiacetarsamide given intravenously. The dosage was 0.1 c.c. of a 1% solution per kg. body-weight daily for 15 consecutive days. At the end of the treatment circulating microfilariae had disappeared or were very much reduced in numbers in all but one case and there was a marked improvement in the clinical signs in most cases. The patients were re-examined three months and one year after treatment and the drug appeared to have had a lasting effect, possibly due to a lethal action on the adult filariae. The side effects were less severe than those following administration of diethylcarbamazine. s.w.

(65n) Thooris has treated 20 cases of lymphangitis caused by *Wuchereria bancrofti* with suramin. Of these, 14 regularly had at least two attacks of lymphangitis per month. The suramin was given intravenously in seven weekly injections, the first of 0.5 gm. and the subsequent six of 1.0 gm. The frequency and severity of attacks was reduced at the end of treatment to an average of 0.37 per person per month, compared with 2.9 per person per month before treatment and only six patients still had attacks. On re-examination three, six and twelve months later, seven, five and five patients were still suffering from the attacks. The effect on the microfilariae was slower but longer lasting than that of diethylcarbamazine. s.w.

(65o) Thooris discusses the various theories of the cause of acute lymphangitis and describes his investigations in 45 patients suffering from acute attacks. Cultures of blood and lymph from each case were negative for bacteria in 91% and 77% respectively. Blood examination revealed an eosinophilia in all the patients which was particularly marked in those with acute filarial manifestations. The proportion of neutrophils remained approximately normal. Treatment with penicillin and terramycin had little effect but aspirin combined with tagathen (an antihistamine) alleviated the symptoms. Treatment with notezine diminished the attacks of lymphangitis and thiacetarsamide had a striking effect on the clinical manifestations; desensitization with *Dirofilaria immitis* antigen reduced the number of attacks by about 90% at the end of five months. From all these observations Thooris concludes that the attacks of lymphangitis are allergic phenomena of filarial origin. s.w.

(65p) Marill has studied 14 irrigation systems in Algeria and found aquatic snails, especially *Bulinus contortus*, in the cement irrigation canals, in the masonry trenches and in the earth channels examined. The type of canalization and source of water did not affect colonization by *B. contortus* and the installation of efficient water pumps did not ensure their destruction. He discusses the ways in which these schistosome vectors could be controlled in irrigation systems and is of the opinion that their construction must be such that periodical drying out is possible. s.w.

(65q) Dollfus identifies an immature echinostome, collected by Rousselot from the small intestine of *Porphyrio alleni* at Brazzaville, as *Echinostoma rousseloti* n.sp. The new species is described and illustrated and its morphology is compared with that of related species from other ralliform-gruiform birds. The cephalic spines are its most distinctive character; they number 47 and are arranged in two rows; the fourth (i.e. the most external) of each corner group of four is much larger than the others. s.w.

(65r) Chabaud & Mouchet have identified as *Parabronema africanum* five female and three male nematodes collected from the liver and heart of a young elephant, *Loxodonta africana*. The specimens were much smaller than those originally described by Baylis but, although the largest females contained embryos, the uterus was only little developed and the authors conclude that their specimens were juveniles. They redescribe and illustrate some of the morphological characters and conclude that *P. congolense* of Vuylsteke, 1953 is a synonym. The unusual location in the blood vessels and its possible significance is discussed. s.w.

66—Bulletin of the State Institute of Marine and Tropical Medicine in Gdańsk Poland.

- a. KOZAR, Z. & SZYMAŃSKA, H., 1956.—“Epidemiologiczne badania nad pasożytami jelitowymi wśród chorych szpitala psychiatrycznego.” 7, 169–178. [English & Russian summaries pp. 176–178.]
- b. KOZAR, Z. & SZYMAŃSKA, H., 1956.—“Przyczynę do częstości występowania pasożytów jelitowych u dzieci wiejskich w woj. gdańskim.” 7, 179–186. [English & Russian summaries pp. 184–186.]

(66a) [This paper has also appeared in *Acta parasit. polon.*, 1956, 3, 245–260. For abstract see *Helm. Abs.*, 25, No. 1d.]

(66b) [This paper has also appeared in *Acta parasit. polon.*, 1956, 3, 269–278. For abstract see *Helm. Abs.*, 25, No. 1f.]

67—Bulletin of the World Health Organization.

- a. AYAD, N., 1956.—“Bilharziasis survey in British Somaliland, Eritrea, Ethiopia, Somalia, the Sudan, and Yemen.” 14 (1), 1–117. [French summary pp. 114–115.]
- b. AZIM, M. A. & GISMANN, A., 1956.—“Bilharziasis survey in south-western Asia, covering Iraq, Israel, Jordan, Lebanon, Saudi Arabia, and Syria: 1950–51.” 14 (3), 403–356. [French summary p. 454.]

(67a) From his survey of schistosome infections in the inhabitants of Somalia, British Somaliland, Eritrea, Ethiopia, the Sudan and Yemen, Ayad has formed the opinion that both *Schistosoma haematobium* and *S. mansoni* are endemic in the main river valleys of Southern Somalia and that either or both of these species are endemic in the inland and highland regions on either side of the Red Sea, but not in the bordering arid lowlands or coastal regions. The report incorporates much local data and assembles relevant information culled from a much scattered literature. It concludes with a general discussion of the socio-economic aspects of schistosomiasis, possible control measures and some malacological notes on African freshwater gastropods.

R.T.L.

(67b) Azim's report to WHO on his survey of bilharziasis and its vectors in south-western Asia was revised and completed after his death by Gismann. In Iraq, bilharziasis haematobia is long established and wide-spread in the irrigated areas in the centre and southern areas. The local conditions at present are likened to those which existed in Egypt a century ago but the vast irrigation schemes now envisaged are likely to create a serious health problem in the future. In Israel, the presence of carriers in the immigrant transitional camps will doubtless intensify the existing slight endemic foci especially along the River Yarkon, but with the absence of large scale irrigation the problem is unlikely to become a serious one. In Jordan, no molluscan vectors were found and it is thought that the disease is unlikely to develop unless it is introduced after the waters of Yarmuk and Jordan rivers are exploited. In the Lebanon, no cases of bilharziasis were traced and none, so far, have been recorded, but *Bulinus* were found in the coastal and central regions. In Saudi Arabia, according to an unpublished report communicated by Dr. Abbot of Dhahran, intestinal bilharziasis is much more widely disseminated throughout the country than had been supposed. The suspected presence of *Schistosoma mansoni* in the Al Kharj and Riadh areas was confirmed and a new focus discovered in Taif Oasis. Evidence was obtained which pointed to Tebuk Oasis in northern Hejaz and to Qasim Province in northern Nejd as foci of *Schistosoma haematobium* infections. *Bulinus forskalii* was found in Hejaz and *B. truncatus* in Hasa Province. Although the snail vectors in self-contained wells could be eliminated by sinking a new shaft and filling in the old one, infected persons would be difficult to reach for treatment. In Syria two foci of vesical bilharziasis are known, viz., in the villages of the Tell Abiad and Qubur el Bid areas in the northern Syrian Jezire where the infection is intense, but still localized.

R.T.L.

68—Bulletin. Wyoming Game and Fish Commission.

- a. HONESS, R. F. & WINTER, K. B., 1956.—“Diseases of wildlife in Wyoming.” No. 9, 279 pp.

(68a) In this monograph the chapter on parasites and parasitic diseases includes a well illustrated account, by Honess, of the cestodes and nematodes of grouse, rabbits and wild ruminants of Wyoming. R.T.L.

69—California Agriculture.

- a. LONGHURST, W. M., 1956.—“Population dynamics of deer. Study of deer herd reveals internal parasites and starvation are most important factors contributing to mortality of deer.” 10 (7), 9-10, 12, 14.
 b. TAYLOR, O. C. & CAHOON, G. A., 1956.—“Citrus rejuvenation studies. Three basic soil treatments used in orchard investigations to determine best conditions for root growth and development.” 10 (8), 3, 14.

(69a) Analysis of the deaths from natural causes in Columbian black-tailed deer in California indicated that the effect of nematode parasitism was probably a most important factor. Over 40 species of helminths were found, twenty of these were common to sheep and deer in the area studied. R.T.L.

(69b) Fumigation with D-D mixture at 70-120 gal. per acre of standing citrus orchards was tested under two types of irrigation and with and without mulching. There was a reduction in fruit production, the roots were killed and the population of citrus nematode effectively reduced. J.B.G.

70—Canadian Journal of Biochemistry and Physiology.

- a. FAIRBAIRN, D., 1956.—“The muscle and integument lipids in female *Ascaris lumbricoides*.” 34 (1), 39-45.

(70a) The total lipids of the muscle and integument of female *Ascaris lumbricoides*, which formed 0.68% of the wet weight, consisted of phospholipids (38%), unsaponifiable material (8%) and triglyceride acids (47%). The unsaponifiable material consisted largely of a substance similar to ascaryl alcohol; sterols were also present. Phosphoacetals, cephalins and lecithins formed the bulk of the phospholipids. Some serine containing phospholipid was present, and probably sphingolipids also. The phospholipid fatty acids appear to be the most highly saturated of known animal phospholipids. The triglycerides contained about an equimolar mixture of volatile and non-volatile acids. W.P.R.

71—Canadian Journal of Botany.

- a. BENEDICT, W. G. & MOUNTAIN, W. B., 1956.—“Studies on the etiology of a root rot of winter wheat in southwestern Ontario.” 34 (1), 159-174.

(71a) In south-western Ontario winter wheat is affected by a root rot with which are always associated the parasitic fungus *Rhizoctonia solani* and the parasitic nematode *Pratylenchus minyus*. In late spring the plants appear stunted, tillering is reduced, the leaves become yellow, dark lesions occur on the basal sheaths and there is rotting of the root cortex. The authors carried out experiments using soil from infested fields treated with either a fungicide, a nematicide, or methyl bromide which acts as both. Some experiments were carried out at constant soil temperatures from 50°F. to 90°F. It was found that growth was increased when either pathogen was controlled and when both were controlled the increase was doubled. In the seedling stage stunting at temperatures of 70°F. to 90°F. appeared to be caused by the fungus, while below 70°F. stunting seemed to be due to nematode damage. In experiments carried on for 30 weeks disease appeared to be most marked about the 18th week and at 90°F. The optimum temperature for nematode development was at least 90°F. In the

later stages of plant growth, in contrast to the seedling stage, the fungus was more active at lower than at higher temperatures. In the field the pathogens invade the roots as soon as they are formed but stunting does not occur until plant growth becomes rapid in late spring. It is thought that the fungus is probably the more important pathogen but it is closely associated with the nematodes since when the latter were reduced with a nematicide the fungus was also reduced although the nematicide has no fungicidal properties. When the fungus was reduced by means of a fungicide this had no effect on the numbers of nematodes. It could not be shown whether the fungus was dependent on the nematode for penetration of the wheat roots or vice versa.

M.T.F.

72—Canadian Journal of Comparative Medicine and Veterinary Science.

- a. POOLE, J. B., 1956.—“Reaction to temperature by infective larvae of *Nematodirus filicollis*, Trichostrongylidae (Nematoda).” 20 (5), 169–172. [French summary p. 172.]
- b. JOHNSTON, E. F. & MACPHERSON, L. W., 1956.—“An outbreak of acute parasitic gastro-enteritis in a herd of cattle in the Ottawa Valley.” 20 (6), 203–205. [French summary p. 205.]

(72a) The optimum temperature for the survival of the infective larvae of *Nematodirus filicollis* is 30°C. At this temperature they can remain alive for 50–60 days. Experiments showed that they can tolerate a temperature range of from –6.5°C. to 74°C. Moist larvae survived repeated freezing at –6.5°C. and thawing at 30°C. After freezing at –6.5°C. for 22 weeks 22% survived. With fast freezing, which lowered the temperature from 24°C. to –28°C., 14% survived. When conditioned at –6.5°C. two or three per cent of the larvae had survived at the end of four hours at –65°C. Ten per cent of moist larvae survived after 52°C. for 8 hours and at 30°C. to 40°C. nearly all desiccated larvae survived while after 74°C. for 24 hours two to three per cent survived.

D.M.

(72b) Johnston & Macpherson reported an outbreak of acute parasitic gastro-enteritis in a herd of cattle in the Ottawa Valley. The affected animals were extremely cachectic, showed tucked-up abdomens, oedema of the submandibular area, marked diarrhoea and bleached mucous membrane. The respiratory rate was more rapid than normal especially when the animals were moved. Counts of helminth eggs by the Stoll technique gave figures of 120,000 to 300,000 eggs per gramme. Examination of the eggs and hatched larvae indicated that *Haemonchus contortus* was the predominant species although *Ostertagia ostertagi* was also significantly present. It is of interest that the pasture had not been grazed by sheep for several years. No material was available for autopsy and although the herd was treated with phenothiazine-hexachlorethane mixture no results are given.

D.L.H.R.

73—Canadian Journal of Zoology.

- a. ANDERSON, R. C., 1956.—“*Elaphostrongylus odocoilei* Hobmaier and Hobmaier, 1934 in the cranial case of *Odocoileus virginianus borealis* Miller.” 34 (3), 167–173.
- b. CHOQUETTE, L. P. E., 1956.—“Observations on experimental infection of dogs with *Echinococcus*.” 34 (3), 190–192.
- c. MAWSON, P. M., 1956.—“Three new species of spirurid nematodes from Canadian birds.” 34 (3), 193–199.
- d. MAWSON, P. M., 1956.—“Spirurid nematodes from Canadian birds.” 34 (3), 206.
- e. MYERS, B. J., 1956.—“An adult *Hemiurus* sp. (Trematoda) from *Sagitta elegans* Verrill.” 34 (3), 206–207.
- f. MARGOLIS, L., 1956.—“Anomalous development of vitellaria in *Hemiurus levinsemi* (Trematoda).” 34 (3), 207–208.
- g. SCHAD, G. A., 1956.—“Helminths recovered from deer mice, *Peromyscus maniculatus*, trapped in the Morgan Arboretum, Macdonald College, Province of Quebec.” 34 (3), 208.
- h. CHOQUETTE, L. P. E. & PIMLOTT, D. H., 1956.—“Gastrointestinal parasites of beaver in Newfoundland.” 34 (3), 209.
- i. WOLFGANG, R. W., 1956.—“An additional note on the distribution of *Biacantha desmoda*.” 34 (3), 209.
- j. ANDERSON, R. C., 1956.—“Two new filarioid nematodes from Ontario birds.” 34 (4), 213–218.

- k. FREEMAN, R. S., 1956.—“Life history studies on *Taenia mustelae* Gmelin, 1790 and the taxonomy of certain taeniod cestodes from Mustelidae.” **34** (4), 219–242.
- l. PEARSON, J. C., 1956.—“Studies on the life cycles and morphology of the larval stages of *Alaria arisaemoides* Augustine and Uribe, 1927 and *Alaria canis* LaRue and Fallis, 1936 (Trematoda: Diplostomidae).” **34** (4), 295–387.

(73a) The cranial cases of 11 out of 37 deer from Algonquin Park, Ontario, were found to contain a number of *Elaphostrongylus odocoilei*. The worms are redescribed and figured and compared with Hobmaier & Hobmaier's original description, which was based on material from the Columbian black-tailed deer. D.M.

(73b) Nine dogs were fed with hydatid cysts and eight were found to have become infected 40–51 days after eating the cysts. During the course of the infection observations were made on the longevity of *Echinococcus granulosus* in situ, on the maturity and pathogenicity of the adults, and on the physical aspects of immature, mature and senile segments eliminated in the faeces. Three of the infected dogs developed a severe diarrhoea, lost weight, became asthenic and died one month after the initial infection. D.M.

(73c) *Microtetrameres canadensis* n.sp. from the snowy owl, *Nyctea scandiaca*, and the great blue heron *Ardea herodias*, differs from *M. accipiter* Schell in the absence of flanges on the female body, the buccal capsule is thin walled, cylindrical at each end with a spherical bulge in the centre. The male tail has a slightly swollen tip. There are three pairs of pre-anal and four pairs of post-anal papillae arranged in two subventral rows with one pair of dorso-lateral papillae. *Synhimantus (Desportesius) canadensis* n.sp. from the bittern, *Botaurus lentiginosus* and the great blue heron, *Ardea herodias* differs from *S. equispiculatus* chiefly in the size and shape of the spicules, of which the longer is 540 μ –660 μ in length, is cylindrical, open and spoon-like distally. The shorter spicule is spatulate, twisted about its midlength and has a thin pocket covering its broadly rounded tip like the leather toe-cap of a shoe. *Echinuria borealis* n.sp. is from the king eider duck, *Somateria spectabilis*, and the old squaw duck, *Clangula hiemalis*. It is closest to *E. uncinata* but the cordons are longer and the male papillae are arranged differently. Their systematic relationships are very briefly discussed. D.M.

(73d) The following spirurids are recorded from birds in Canada. *Habronema mansonii* Seurat in *Buteo jamaicensis borealis* and *Falco peregrinus anatum*, *Microtetrameres helix* Cram and *Acuaria anthuris* (Rud.) from *Corvus b. brachyrhynchos*, *Aviculariella alcyona* Wehr from *Megaceryle a. alcyon* and *Echinuria uncinata* (Rud.) from *Anas p. platyrhynchos*. *Acuaria nebraskensis* Williams is a synonym of *A. anthuris* (Rud.) R.T.L.

(73e) Six adult trematodes were collected from the alimentary canal of *Sagitta elegans*. They were identified as belonging to the genus *Hemiurus*, but specific identification was impossible due to the contraction of the specimens. They resemble very closely *H. levinseni* Odhner, 1905, a common parasite of N. American fishes, and of young plankton-feeding fish. The source of infection of the latter is assumed to be the same as for *Sagitta*; the parasites probably being neotenic larvae in the *Sagitta*, which serves as a transport host and source of infection rather than as an essential intermediate host. D.M.

(73f) During a survey of the parasites of North American salmon, a single pink salmon was found to contain 101 specimens of *Hemiurus levinseni* Odhner. Of this number one trematode was found to have three compact vitelline glands, as compared with the normal two. This is cited as the first record of an extra vitelline gland in a trematode. D.M.

(73g) The following helminths were collected from 57 deer mice, *Peromyscus maniculatus*, at Ste. Anne de Bellevue. *Postharmostomum helcis*, *Syphacia peromysci*, *Capillaria* sp., *Mastophorus muris*, *Cysticercus tenuicollis* and, from the liver, a *Metacercaria* sp.? R.T.L.

(73h) Eighty out of eighty-nine beavers, trapped in various parts of Newfoundland, were found to contain *Travassosius americanus* (85%), *Castorstrongylus castoris* (20%), and *Stichorchis subtriquetrus* (90%). 2,642 specimens of *T. americanus* were collected from one beaver. D.M.

(73i) A total of 9 specimens of *Biacantha desmoda* were collected from 5 out of 15 vampire bats (*Desmodus rotundus murinus*) obtained from Mexico. This new material conformed to the original description of this worm except that, while the cuticular expansions on the head of the male and female were similar, the hooks on the females were larger than those on the males. R.T.L.

(73j) *Diplotriaenoides translucidus*, n.sp., from under the peritoneum of the oven bird *Seiurus aurocapillus*, differs from the three known species of the genus in having the oesophagus divided into a short anterior muscular part and a long broad glandular portion. The tridentia are less strongly cuticularized. *Ornithofilaria inornata* n.sp., from the body cavity of the wood thrush *Hylocichla mustelina*, is distinguished from the seven other species of the genus by the position of the vulva which lies considerably behind the junction of the oesophagus and intestine. The hosts of these two new species were collected in Algonquin Park, Ontario. R.T.L.

(73k) *Taenia tenuicollis* Rud., 1819, the small hooked cestode from the European weasels is a synonym of *Taenia mustelae* Gmelin, 1790. *T. mustelae* was found in *Mustela erminea* in Minnesota and Ontario. Experimental feeding of the eggs to eight rodent species produced multicolex larvae, or multicolex and uniscolex larvae simultaneously, but never uniscolex larvae exclusively although these occasionally occurred in nature. The growth of *T. mustelae* larvae in *Peromyscus maniculatus* and the host reactions are described in detail. Adults were produced when multicolex larvae from a naturally infected mouse were fed to a mink. *Taenia intermedia* Rud., 1810, a synonym of *Halysis martis* Zeder, 1803, is transferred to *T. martis* (Zeder, 1803) n.comb. (based on Goeze, 1782). It was collected from *Martes americana* in Ontario, a first record for North America. *Taenia skrjabini* Romanov, 1952, and *Taenia sibirica* Dubnitski, 1952, are added to its synonymy. Uniscolex cysticerci, identified as the larvae of *T. martis* on the basis of the rostellar hooks, were found free in the pleural cavity of two *Clethrionomys gapperi* in Algonquin Park, Ontario. R.T.L.

(73l) Pearson has followed experimentally the life-cycles of *Alaria arisaemoides* and *A. canis*. In both a mesocercarial stage is interpolated between the cercaria and the metacercaria and three hosts are essential. Under experimental conditions the miracidia of *A. arisaemoides* developed, in sporocysts, into cercariae in *Planorbula armigera* and *Promeneis exacuous* and those of *A. canis* in *Helisoma trivolvis*, *H. campanulatum* and *H. druyi*. The free-swimming cercariae of both species penetrated into the tadpoles and adults of *Rana pipiens*, *R. sylvatica* and *Bufo americanus* and became mesocercariae in the tissues. When fed to foxes they underwent somatic migration to the lungs where they developed into diplostomula and subsequently reaching the gut, presumably via the bronchi and trachea, attained sexual maturity. The cercariae were also able to penetrate a variety of paratenic hosts, became mesocercariae and survived without developing further. Many other observations follow including details of the hatching of the eggs, the morphology of the larval stages, the route and time and variations in emergence of the cercariae from the molluscan hosts, the locomotion and the change in distribution of the mesocercariae during the metamorphosis of the tadpoles. R.T.L.

74—Central African Journal of Medicine.

- a. HONEY, R. M. & GELFAND, M., 1956.—“Ileo-cystoplasty in chronic bilharzial cystitis.” 2 (1), 1-5.
- b. KENNEDY, A. F., 1956.—“Some aspects of a hookworm ‘carrier’ state in African mine workers.” 2 (3), 104-106.

(74b) Kennedy has studied 62 African mine-workers who were infected with hookworm. Few physical signs were evident but the level of the blood haemoglobin was significantly lower than that in healthy controls. Eosinophilia was observed in only 22 of the cases. The fact that the condition of most of the patients could be classified as a “carrier” state is attributed largely to the fact that they receive a generous and well balanced diet. S.V.

5—Ceylon Veterinary Journal.

- a. SHOHO, C., 1956.—“The treatment of cerebrospinal nematodiasis by 1-diethylcarbamy1-4-methylpiperazine dihydrogen citrate.” 4 (1), 6-10.
- b. VARMA, A. K., 1956.—“Some photomicrographs depicting the pathology of filarial ‘hump-sore’ in cattle.” 4 (1), 11-13.
- c. PERERA, S. J. E., 1956.—“Preliminary survey of the incidence of filariasis in dogs in Kandy district.” 4 (1), 22-24.

(75a) Shoho considers that in cerebrospinal nematodiasis the immature worms or larvae cause damage in much the same way as a fine needle would do and that if the larvae are inactivated at once by filaricidal treatment further damage may be prevented and recovery may ensue. He has found that caricide in a single dose of 20 mg. to 40 mg. per kg. body-weight apparently inactivated the migrating worms for at least three weeks. As a therapeutic measure against older worms in the central nervous system it was necessary to give from 40 mg. to 100 mg. per kg. body-weight. Even if the worms are killed there may be a delay of several days before there is evidence of functional recovery. R.T.L.

(75b) “Hump sore” in cattle is a chronic granulomatous ulcerative condition of the skin caused by larval and adult forms of *Stephanofilaria assamensis*. It is reputed to occur in Bengal, Orissa and Bihar. Recently Varma has seen a number of cases in the district of Purnea and particularly in the Forbesganj, Araria and Kishanganj areas. Four photomicrographs of sections of the ulcerating skin lesion are reproduced. R.T.L.

(75c) In Kandy 29 out of 55 dogs had non-periodic microfilariae in their blood. Sixteen showed a prurigenous skin eruption. Adult filarial worms from the subcutaneous tissues await identification, but were probably *Dirofilaria repens*. R.T.L.

76—Chinese Medical Journal.

- a. CHUNG, H. L., HOU, T. C., LI, T. H., SHEH, M. P. & YANG, C. L., 1956.—“Recent advances in diagnosis of paragonimiasis.” 74 (1), 1-16.
- b. FENG, L. C., 1956.—“The combined use of pumpkin seed and areca nut in the treatment of tapeworm infections.” 74 (1), 17-36.

(76a) For the diagnosis of inapparent, obscure or atypical cases of paragonimiasis, without discharge of eggs in the faeces, the use in all suspected cases of a triad of procedures is advocated, viz., (i) intradermal test, (ii) complement fixation test and (iii) epidemiological data. In the authors' experience the intradermal test has invariably given a positive reaction. In the 2,309 individuals examined this test was positive in 398, whereas eggs were found in the faeces only in 117. The reaction to the complement fixation test was clear-cut in 50 out of 51 proved cases of paragonimiasis. 20 out of 24 patients with cerebral involvement proved positive, while cerebrospinal fluid from paragonimus patients without cerebral involvement was always negative. There are six illustrative case reports, with photomicrographs. R.T.L.

(76b) Pumpkin seed acts chiefly on the middle and posterior part, while areca nut acts on the scolex and immature anterior portions, of *Taenia saginata* and *T. solium*. When used together their action is synergistic and a high percentage of cures results from the administration of a combination of pumpkin seed kernels and areca nut concoction. About 80-125 gm. of pumpkin seed powder followed, two hours later, by 60-100 gm. of areca nut decoction and, after another half-hour, by 30 gm. of magnesium sulphate are quite sufficient. R.T.L.

77—Clinica Veterinaria. Milan.

- a. LAI, M., 1956.—“La strongilosi gastro-intestinale dei ruminanti in Sardegna. Nota I. Gli strongili dell'abomaso.” 79 (3), 65-71. [English summary p.71.]

(77a) In an investigation into gastro-intestinal trichostrongylosis in ruminants between March and August in Sardinia, 339 cattle, 337 sheep and 286 goats were examined. Ninety-four of the cattle, 135 of the sheep and 175 of the goats had *Haemonchus contortus*; 134 of the cattle

and three of the sheep had *Ostertagia ostertagi*; 23 of the cattle had *O. lyrata*; 177 of the sheep and 286 of the goats had *O. circumcincta*; 84 of the sheep and 91 of the goats had *O. trifurcata*; 11 of the sheep and 13 of the goats had *O. pinnata*; 106 of the cattle, 143 of the sheep and 144 of the goats had *Trichostrongylus extenuatus*; 16 of the sheep and 49 of the goats had *T. vitrinus*; 12 of the sheep and 42 of the goats had *T. colubriformis*; 26 of the cattle had *Cooperia punctata* and 98 of the goats had *T. capricola*. The monthly incidence of each species in each host is tabulated.

M.MCH

78—Comptes Rendus des Séances de l'Académie des Sciences. Paris.

- a. LAMY, L., 1956.—“Identité possible des substances actives sur la formation des dispositifs capteurs chez les hyphomycètes prédateurs et des substances antigéniques des extraits d'helminthes parasites.” 242 (5), 692-694.

(78a) Lamy had studied the ability of various helminth extracts to stimulate trap formation in predatory hyphomycetes and has investigated the similarity between these substances and helminth antigens. Hydatid fluid and extracts of *Fasciola hepatica* and *Parascaris equorum* were used and detailed results will be published later. The following facts were established: (i) keeping at 15°C. to 20°C. caused loss of antigenic and fungus-stimulating properties, (ii) keeping at -20°C., even for prolonged periods, did not alter either property, (iii) heat destroyed the substance or substances, (iv) lyophilization did not affect them and (v) addition of anti-septics such as 2:1,000 formol did not destroy them.

S.W.

79—Comptes Rendus des Séances de la Société de Biologie. Paris.

- a. MAEKAWA, K. & KUSHIBE, M., 1956.—“Sur la composition chimique de l'antigène pour la dermo-réaction allergique vis-à-vis de *Fasciola hepatica*.” 150 (4), 832-834.

(79a) Analysis of an antigen prepared from *Fasciola hepatica* revealed 15 amino-acids. The glutamic acid, aspartic acid and valine content was high. Methionine, phenylalanine, isoleucine and proline were absent although leucine and oxyproline were present.

S.W.

80—Cornell Veterinarian.

- a. RUBIN, R. & LUCKER, J. T., 1956.—“Acquired resistance to *Dictyocaulus viviparus*, the lungworm of cattle.” 46 (1), 88-96.

(80a) Calves which received, as a single dose, 52,000 to 58,000 infective *Dictyocaulus viviparus* larvae after they had eliminated an initial patent infection proved insusceptible to reinfection as no first-stage larvae appeared in the faeces. One calf which had received a challenging dose of 64,000 larvae was still immune to patent reinfection seven months after it had eliminated its initial infection. No patent infections resulted from further exposure to challenging infections. Faeces examinations showed that the larvae administered to resistant animals were unable to develop to maturity and nearly all the young lungworms were usually eliminated within three weeks. With prolonged low level exposure and about 2 to 2½ months after massive re-exposure there was no accumulation of immature worms in the lungs, and the average peak eosinophilia was 32% on about the 12th day after re-exposure.

R.T.L.

81—Current Science. Bangalore.

- a. SINGH, K. P., 1956.—“*Echinorhynchotaemia lucknowensis* n.sp. (Hymenolepididae: Cestoda) from darter, *Anhinga melanogaster* Pennant.” [Correspondence.] 25 (2), 59.
- b. MUKERJI, D. & RAYCHOUDHURI, S., 1956.—“Occurrence of a mermithid worm parasite on *Helopeltis theivora* Waterhouse.” [Correspondence.] 25 (2), 60-61.

(81a) *Echinorhynchotaemia lucknowensis* n.sp. from *Anhinga melanogaster* differs from *E. tritesticulata* and *E. nana* in the triangular arrangement of the three testes.

R.T.L.

2—Deutsche Tierärztliche Wochenschrift.

- a. SPREHN, C., 1956.—“Seltene Helminthen in deutschen Farmnerzen.” **63** (33/34), 342-346.

(82a) Sprehn's report of deaths caused by *Tocotrema lingua* and *Apophallus muehlingi* in mink on farms in northern Germany is the first record of these flukes in *Lutreola vison* reared in Germany. *Corynosoma strumosum* and *Echinorhynchus gadi* were also found. These acanthocephalans and *Apophallus muehlingi* have not been previously reported from this host. The nine species of Trematoda, one of Cestoda, six of Nematoda and three of Acanthocephala now known from minks, are listed with their chief synonyms and with notes on their occurrence in Germany. M.MCK.

3—Documenta de Medicina Geographica et Tropica. Amsterdam.

- a. WINCKEL, W. E. F. & TREURNIET, A. E., 1956.—“Infestation with *Lagochilascaris minor* (Leiper) in man.” **8** (1), 23-28.
 b. WEYTS, E. J., 1956.—“Ocular manifestations in onchocerciasis.” **8** (1), 29-38.
 c. FROS, J., 1956.—“Filariasis in South-American Indians in Surinam.” **8** (1), 63-69.
 d. LIE KIAN JOE & TAN KOK SIANG, 1956.—“Helminthiasis of the intestinal wall caused by *Ancylostoma duodenale*.” **8** (1), 75-79.
 e. FIELDS, D. N., SELLY, G. W. & GUTCHERIT, I. D., 1956.—“The treatment of ascariasis with piperazine.” **8** (1), 80-84.

(83a) When a swelling on the side of the neck of a Negro woman, from the Para district about 40 km. from Paramaribo, was extirpated, about 900 *Lagochilascaris minor* were found in a cavity about the size of a walnut and many more in branches into the surrounding tissue. The blood showed an eosinophilia of 11%. The faeces were negative for helminth ova. As swellings with festering wounds on uncovered parts of the body are often seen in the interior of Surinam this infection may not be rare. R.T.L.

(83b) Weyts has investigated the ocular complications in 180 Congolese and 15 white patients who contracted onchocerciasis near the rapids in the vicinity of Leopoldville. Keratitis punctata was the commonest ocular complication, vascular keratitis or filarial pannus was much less frequent. Chronic conjunctivitis also occurred; microfilariae were found in a fragment of conjunctiva in 15 out of 25 patients. In some patients there were small conjunctival nodules which disappeared within three to five weeks. There was blindness in one or both eyes in 180 patients in Leopoldville and in 16 of these there was increased intraocular pressure. Everything depends on early treatment. The schedule recommended is (i) surgical removal of the nodules, (ii) a fifteen-day course of carbilazine or hetrazan and (iii) a course of antrypol. The insect vector is best combatted by D.D.T. spraying. R.T.L.

(83c) Fros reports the results of the examination for microfilariae of blood films from inhabitants of different races living in the savannah belt and in the interior of Surinam. Unsheathed microfilariae were present in the blood of 28.7% of the Lowland Amerindians and in 1.9% of the Creoles. Although *Acanthocheilonema perstans* was probably imported in Negro slaves from Africa it is not found in the Bush Negro but is present in Amerindians in the savannah belt. The Upland Amerindians are not infected with filariae. *Microfilaria bancrofti* was only found in one Amerindian, one Hindustani, three Bush Negroes and five Creoles. R.T.L.

(83d) Eleven female and four male hookworms were dissected from lesions in the intestinal wall. Although the spicules measured only 1.59 mm., whereas in *Ancylostoma duodenale* they are about 2 mm. in length, it is considered that these hookworms belong to the species *A. duodenale*. As the female in the intestinal wall deposited large numbers of eggs in the tissues and rhabditiform larvae were recovered from the lesions the possibility of auto-infection is suggested. R.T.L.

(83e) The eradication of *Ascaris lumbricoides* infection from 38 out of 56 individuals after a single dose of piperazine citrate as a syrup and from 8 out of 12 individuals who received a tablet containing 500 mg. of the drug, is reported. R.T.L.

84—East African Medical Journal.

- a. KIREMERWA, D. N., BYARUHANGA, D. B. & RAPER, A. B., 1956.—“Sparganosis with report of two cases.” 33 (2), 37-42.

(84a) Two cases of sparganosis are reported from Uganda. In one the tapeworm was found in a tumour-like mass involving the wall of the colon and simulating a carcinoma. In the other, a Lango male, it was taken from a small nodule under the conjunctiva. The patient denied that they had ever made a local application to the skin of any possibly sparganum bearing vertebrate tissue. R.T.T.

85—Euphytica. Wageningen.

- a. POOS, J. A. J., 1956.—“The breeding of a winter rye variety with a good eelworm-resistance.” 5 (1), 33-40.

(85a) Good eelworm resistance is shown by local varieties of winter rye but their straw is weak and their yield poor. The variety Heertveld, a cross between Ottersum and Petkus has stiff straw and is resistant to *Ditylenchus dipsaci*. In the laboratory up to 25% of the plants were attacked but in the field the resistance was good, due to good recovery. Selection for eelworm resistance and other characters continues and the yield of Heertveld is now nearly as good as that of Petkus. J.B.

86—Experimental Parasitology. New York.

- a. INGERSOLL, E. M., 1956.—“*In vitro* survival of rediae of *Cyclocoelum microstomum*.” 5 (3), 231-237.
 b. OLIVER, Jr., J. H. & SHORT, R. B., 1956.—“Longevity of miracidia of *Schistosomatium douthitti*.” 5 (3), 238-249.
 c. SMYTH, J. D., 1956.—“Studies on tapeworm physiology. VIII. Occurrence of somatic mitosis in *Diphyllobothrium* spp. and its use as a criterion for assessing growth *in vitro*.” 5 (3), 260-270.
 d. WEINBACH, E. C. & NOLAN, M. O., 1956.—“The effect of pentachlorophenol on the metabolism of the snail *Australorbis glabratus*.” 5 (3), 276-284.
 e. READ, C. P., 1956.—“Carbohydrate metabolism of *Hymenolepis diminuta*.” 5 (4), 325-344.
 f. BUEDING, E. & FARROW, G. W., 1956.—“Identification of succinic acid as a constituent of the peritenteric fluid of *Ascaris lumbricoides*.” 5 (4), 345-349.
 g. BIRD, A. F., 1956.—“Chemical composition of the nematode cuticle. Observations of the whole cuticle.” 5 (4), 350-358.
 h. DAUGHERTY, J. W. & TAYLOR, D., 1956.—“Regional distribution of glycogen in the nematode, *Hymenolepis diminuta*.” 5 (4), 376-390.
 i. SCHNEIDER, M. D., RADKE, M. G. & COLEMAN, M. T., 1956.—“Immunological reactive substance from *Schistosoma mansoni*.” 5 (4), 391-397.
 j. HOEPLI, R., 1956.—“The knowledge of parasites and parasitic infections from ancient times to the 17th century.” 5 (4), 398-419.

(86a) Ingersoll describes a technique for obtaining axenic rediae of *Cyclocoelum microstomum* and for maintaining them *in vitro*. Of 19 culture media tested, Medium 7 (containing 10 ml. of 0.9% sodium chloride solution, 2 ml. of 2% agar, 4 ml. of 2% glucose, 7.5 ml. of fresh rabbit blood serum, 6.5 ml. of Carriker's saline and 8 ml. of chick embryo extract) allowed the maximum survival time of 14 days with 12 days of normal activity. Two other media gave survival times of eleven and nine days respectively. Although no appreciable growth or development of the rediae occurred they apparently did utilize nutrient material from the media. The observations suggest that cultures with large numbers of rediae maintained life longer than did cultures with fewer rediae. S.W.

(86b) In nine experiments Oliver & Short observed the longevity of 1,217 miracidia of *Schistosomatium douthitti*. For eight experiments filtered Wakulla River water was used and for the ninth, water from the Wakulla Spring itself; this water is “moderately hard” and of practically constant chemical composition and pH. The over-all temperature range was 22.2°C. to 25.6°C. During the first hour after hatching 12.8% of the miracidia died.

25.7% were dead after three hours and 49.2% after nine; a few (0.6%) lived for 24 hours but all were dead by the 25th hour. The authors suggest that the initial death rate (beginning within one hour of hatching) reflects the different lengths of time the mature miracidia had lived within the host's tissues; it is probable that the host exerts a deleterious influence on the miracidia while they remain in its liver and also that ageing of the miracidia themselves would weaken them. S.W.

(86c) Smyth has devised a technique by which he has demonstrated somatic mitosis in plerocercoid larvae of *Diphyllobotrium* spp. All the conventional phases from prophase to telophase were observed. By adding colchicine at a concentration of 10^{-4} to Tyrode and incubating the larvae in this solution for five hours, spindle formation is prevented and the chromosomes do not separate after prophase splitting. Larvae are removed, fixed in aceto-orcein and squash preparations examined. After observing the colchicine-treated material he became familiar with the small size of the nuclei (2μ) and expected size and appearance of the chromosomes and confirmed his observations on untreated material. Somatic mitoses were not seen in sections of material treated with colchicine and fixed by routine methods but could be discerned in sections fixed and swollen by aceto-orcein fixation. Observations on the number of mitoses per 30 oil immersion fields (taking 10 per 30 fields as a tentative growth threshold) indicated that larvae can be considered to be merely surviving and not growing after three days' cultivation. In spite of the high experimental error in the counting procedure this technique is potentially a useful criterion between growth and survival in helminth culture work. S.W.

(86d) After exposure aerobically to pentachlorophenol (concentration $7.5 \times 10^{-6}M$, i.e. 2 p.p.m.) for 24 hours the tissues of *Australorbis glabratus* revealed an increase in the acetate, lactate, pyruvate, and inorganic orthophosphate levels over those in the controls; the tissue level of pentachlorophenol rose to $4.4 \times 10^{-4}M$ in 30 hours. The snails were not retracted. If exposure was limited to six hours the effect was reversible. At concentrations as low as $2 \times 10^{-6}M$ the respiration of living snails was stimulated but at $2 \times 10^{-5}M$ it was inhibited. The authors believe that the molluscicidal property of pentachlorophenol is due, at least in part, to its ability to uncouple oxidative phosphorylation. S.W.

(86e) Read found that the Q_{O_2} of *Hymenolepis diminuta* rose from about 0.7 to 4.5 as the oxygen tension was raised from 2.1 to 21 volumes per cent. The endogenous respiratory quotient was about 0.5; in the presence of glucose it rose to 1. Glucose, succinate, malate, glycerophosphate and malonate stimulated or supported respiration. *In vivo* the worm used 5 gm. of glycogen per 100 gm. tissue in 20 hours; *in vitro* it used 4.4 gm. Under anaerobic conditions lactate production rose by 31%. No metabolic gas was produced. Glucose increased lactate production. Galactose was used less actively than glucose; fructose and a number of disaccharides were not used to any appreciable extent. Differences in polysaccharide content, acid production and glucose utilization were found in different parts of the worm. The data are compared with similar data in other cestodes. W.P.R.

(86f) Succinate occurs in the perienteric fluids of *Ascaris lumbricoides* in concentrations of 5.3 to $12.0\mu M$ per ml. W.P.R.

(86g) Bird found 16 amino-acids in acid-hydrolysates of the cuticles of adult *Ascaris lumbricoides*, *Toxocara mystax* and *Strongylus equinus*. Lipid and aldohexose were detected in trace amounts in *A. lumbricoides* and *S. equinus*. W.P.R.

(86h) The glycogen content of *Hymenolepis diminuta* was highest in the region nearest the scolex; it dropped in the next 10 cm., rose in the succeeding 10-20 cm., remained fairly constant and then finally declined to the last remaining gravid proglottides. Fasting the host for 24 hours strongly reduced the glycogen content of the first 30 cm. of the worm but had little effect on the remainder. W.P.R.

(86i) Adult *Schistosoma mansoni* were ground in aqueous medium and extracted with a mixture of chloroform and isoamyl alcohol (4:1). The water-soluble material remaining after dialysis contained a relatively heat-stable antigen which reacted in the complement fixation test with serum of human patients infected with *S. mansoni*. The preparation also reacted with a heterophile substance present in the serum of the normal rabbit. W.D.

87—Extension Folder. North Carolina State College of Agriculture.

- a. SKOTLAND, C. B., WINSTEAD, N. N. & SASSER, J. N., 1956.—“The soybean nematode disease.” No. 126, 5 pp.

(87a) *Heterodera glycines* has been found in North Carolina where it causes soya beans to be stunted and to yellow prematurely. Other susceptible crops are snap beans, vetch and annual lespedeza. Recommendations for control include the growing of non-susceptible crops, care in preventing spread of infected soil, and chemical treatment of gladiolus corms and daffodil bulbs to prevent spread on them. J.H.

88—Farming in South Africa.

- a. ANON., 1956.—“Damage amounting to millions of pounds caused annually by eelworms.” 32 (2), 21–25.

(88a) This is an account of the efforts of the Department of Agriculture to find suitable measures to control eelworm infections in potatoes, tomatoes, beans, tobacco, and other vegetables and in cereals, which annually cause wide-spread damage in South Africa. The direct or indirect damage to crops in the irrigated soil amounts to millions of pounds. Various examples are given of the increase in crops following soil fumigation and the addition of fertilizers. As *Eragrostis curvula* (Ermelo type) is not susceptible to eelworm, potato and tobacco farmers are advised to plant this instead of fallowing.

89—Folia Biologica. Prague.

- a. ERHARDOVÁ, B. & RYŠAVÝ, B., 1956.—“Zur Frage der quantitativen koprologischen Untersuchungsmethoden in der Helminthologie.” 2 (3), 172–176. [Also in Russian pp. 177–181.]

(89a) To reassess the value of quantitative coprological methods faecal samples were examined (by Willys' method) from two sheep three times daily for 27 days and it was found that the number of eggs of intestinal worms varied in the course of the day without any regularity. The number of eggs and of larvae in single pellets varied greatly when the total faecal matter passed in two days by two further sheep was examined by Vajda's method. Typical results were 348 (maximum) and 20 (minimum) eggs per pellet for intestinal worms and none to 13 larvae for *Dictyocaulus*. Thus, in practice the quantitative methods are on a par with those of the same value as qualitative ones and the testing of single samples is insufficient in either case. Of 57 pellets examined from a deer, 27 were negative. Of the 30 positive pellets, 15 contained larvae of *Capreocaulus*, five of *D. viviparus* and three of both kinds. Even careful mixing of faecal matter by any of the ways recommended in coprological methods did not give an even distribution of the eggs or larvae. G.I.

90—Fukuoka Acta Medica.

- a. TOMITA, C., 1956.—[Experimental studies on *Paragonimus ohirai* Miyazaki, 1939.] 47 (1), 462–487. [In Japanese: English summary pp. 462–465.]

(90a) When rats were experimentally infected with metacercariae of *Paragonimus ohirai*, complete worm cysts were formed in the lungs but when mice were similarly infected the

died before the formation of cysts was completed owing to haemorrhages and the accumulation of bloody and pus-like exudates in the thoracic cavity, haemoptysis and congestion of the lungs, and liver abscesses due to the mechanical and toxic effect of the wandering of the parasites. When liquid contents of worm cysts were injected into mice the lung became highly atelectatic, the bronchi and surrounding tissues were infiltrated with cells, the liver cells were swollen and there was fatty degeneration, the adrenals were congested and the spleen was splenopathic. The glycogen content of the liver was reduced after infection in both rats and mice and in mice injected with worm cyst fluid. Wassermann's test was negative in all the experimental animals and in the rats Takada's serum reaction became intensified about 20 days after ingestion of the metacercariae but gradually became less until by the 60th day it became negative. R.T.L.

91—Gartenbauwirtschaft.

- a. OOSTENBRINK, M., 1956.—“Bedeutung der Nematoden im Gartenbau.” No. 2/3. [Reprint 5 pp.]

(91a) In this popular account of the importance of nematodes in horticulture the author deals briefly with leaf eelworms (*Aphelenchoides*), stem eelworms (*Ditylenchus*), root-knot eelworms (*Meloidogyne*), cyst-forming eelworms (*Heterodera*) and ectoparasitic eelworms (*Paratylenchus*, *Hoplolaimus*, *Tylenchorhynchus* and *Pratylenchus*), mentioning briefly in each case means of control. M.T.F.

92—Giornale di Malattie Infettive e Parassitarie.

- a. LO NIGRO, M., 1956.—“I primi casi di anchilostomiasi nella Provincia di Matera.” 8 (1), 28. [Discussion p. 29.]

93—Gunma Journal of Medical Sciences.

- a. NAGATA, K., BABA, T., NAGASAWA, Y., TAKAGI, K. & HARA, K., 1956.—“Effect of cortisone on the course of *Schistosoma japonicum* infection in mice, particularly on the hepatic tissue.” 5 (1), 24–36.
b. SUGIURA, S., 1956.—“Simple operation for prolonged relief of ascites, intractable symptom of chronic schistosomiasis.” 5 (2), 105–108.

(93a) In mice experimentally infected with *Schistosoma japonicum* loss of weight, increase in emaciation and mortality followed the repeated administration of cortisone. There was no evidence that survival time was prolonged. The occurrence of acid mucopolysaccharides and of connective tissue fibres in schistosome foci was inhibited. R.T.L.

94—Indian Journal of Medical Research.

- a. GADGIL, R. K. & SHAH, S. N., 1956.—“Human schistosomiasis in India. Part IV. Establishing the life cycle in the laboratory.” 44 (3), 577–580.

(94a) In the endemic focus of human schistosomiasis at Gimbvi, near Bombay, there are two species of fresh-water molluscs, viz., *Ferrissia tenuis* and *Paludomus obesa*. A colony of *F. tenuis* was bred in the laboratory and was experimentally submitted to infection with miracidia hatched from eggs passed in the urine of a patient from Gimbvi. The mortality among the snails was high but some of those which had survived for four weeks emitted a small number of cercariae. Four laboratory-bred white mice were then submitted to infection. Three which died during the first month proved negative but schistosome males and females in copula were found in the liver of the fourth mouse, killed on the sixty-second day after infection. *Paludomus obesa* proved resistant to infection. R.T.L.

95—Indian Journal of Veterinary Science and Animal Husbandry.

- a. MOHIYUDDIN, S., 1956.—“Enzootic bovine paraplegia in some Malnad tracts (hilly and heavy rainfall region) of Mysore State with particular reference to cerebrospinal nematodiasis as its probable cause.” 26 (1), 1-19.
- b. KATIYAR, R. D., 1956.—“A preliminary report on cymbiformiasis in sheep and goats of Uttar Pradesh hills.” 26 (1), 21-26.
- c. PETER, C. T., 1956.—“Studies on the cercarial fauna in Madras. IV. The amphistomes and gymnocephalous groups of cercariae.” 26 (1), 27-30.
- d. SINGH, A. & CHAK, I. M., 1956.—“Inhibitory effect of kamala (*Mallotus philippinensis*) on succinic dehydrogenase of tape worm (*Moniezia expansa*).” 26 (1), 31-34.

(95a) The contiguous areas, north Kanara district of Bombay and the Shimoga and South Kanara districts of Mysore are an endemic zone for bovine paraplegia and paralysis. Histological studies of the brain and spinal cord from affected animals revealed the presence of nematode larvae and demonstrated for the first time the occurrence of cerebrospinal nematodiasis in cattle. R.T.L.

(95b) Heavy infections of the intestines with the trematode *Cymbiforma indica* have recently caused heavy losses in sheep in the Kumaun hills of Uttar Pradesh. Goats were also found infected. The clinical symptoms were anaemia, debility and muco-purulent enteritis. Millions of the parasite were found free and adherent to the gut wall of the first forty feet of the small intestine causing superficial necrosis and local eosinophilic infiltration. Treatment with hexachlorethane in doses of 2 to 4 drachms and carbon tetrachloride in doses of 1 to 2 c.c. with 418 c.c. of liquid paraffin was equally efficacious, but tetrachlorethylene had little or no effect. R.T.L.

(95c) Seven known species of cercaria were found in fresh-water molluscs in Madras City. *C. indicæ xxvi*, *C. Kylasami* and *C. gastrodisci secundi* were from *Indoplanorbis exustus* and *C. indicæ xxix* from *Limnaea luteola forma succinea*. Three gymnocephalous cercariae *C. indicæ iii*, *C. indicæ vii* and *C. indicæ viii* occurred in *Melanoides tuberculatus*. R.T.L.

(95d) Kamala has a pronounced inhibitory action on the succinic dehydrogenase activity of *Moniezia expansa* which increases with the concentration of the drug. The inhibition increases progressively in the alkaline region and with the length of contact between the drug and the enzyme system. The inhibition is probably competitive. R.T.L.

96—Indian Veterinary Journal.

- a. PANI, S. N., 1956.—“Occurrence of *Multiceps* cysts in the intermuscular connective tissue of goat.” 32 (6), 474-475.
- b. DAS GUPTA, B. R. & MUKHERJI, A., 1956.—“Study of anthelmintic property of garlic in poultry.” 33 (1), 57-60.
- c. GANGULEE, H. C., 1956.—“Cardiac hydatidiasis in the bovine.” [Correspondence.] 33 (1), 77-78.
- d. SAMBAMURTHY, B., 1956.—“Cardiac hydatidiasis in the bovine.” [Correspondence.] 33 (1), 78.

(96b) Garlic, given as a whole bulb daily for three consecutive days to domestic fowl before their morning ration, was willingly eaten and proved efficacious against *Capillaria* to a less degree against *Heterakis* and least against *Ascaridia*. Its action was more that of a vermifuge than a vermicide and was aided by the administration of a laxative dose of olive oil after the garlic had been eaten. As garlic is also a powerful antiseptic and is rich in vitamins and minerals it possesses a distinct food value and is cheap. R.T.L.

97—Journal of the American Veterinary Medical Association.

- a. BRADLEY, R. E., CRIMMINS, L. T. & ZWEIGART, T. F., 1956.—“Preliminary studies on the anthelmintic properties of piperazine citrate in dogs.” 128 (8), 393-394.
- b. TURK, R. D. & HALE, F., 1956.—“Observations on ascaricides in swine.” 128 (8), 405-407.
- c. HITCHCOCK, D. J., 1956.—“A survey of gastrointestinal parasites of cattle in South Carolina.” 129 (1), 34-35.

- d. BUSH, D. L., 1956.—“No *Echinococcus* found in Iceland.” **129** (2), 67.
- e. CAMPBELL, W. C., TODD, A. C., COX, D. D. & KROHN, A. F., 1956.—“Monieziosis in a Wisconsin lamb.” **129** (2), 74-75.
- f. MARQUARDT, W. C. & FRITTS, D. H., 1956.—“A test of two piperazine compounds against nematodes of sheep.” **129** (4), 153-155.
- g. RIEDEL, B. B. & LARSON, E. J., 1956.—“The critical evaluation of a new swine anthelmintic containing piperazine and carbon disulfide—Parvex.” **129** (4), 156-159.
- h. GANDAL, C. P., 1956.—“The use of piperazine adipate in ascariasis of captive zebras.” **129** (4), 159-160.
- i. HAYES, F. A. & JORDAN, H. E., 1956.—“Canine helminthiasis complicated with *Balantidium* species.” **129** (4), 161.

(97a) Experiments on dogs indicate that piperazine citrate, given orally, is a highly efficient anthelmintic against ascarids, has a variable effect against hookworms and little or no effect against whipworms and tapeworms. After ten consecutive daily doses of the drug, at 80 mg. per lb. body-weight, 75% of the treated dogs were free of hookworms and all were free of ascarids. A single dose at the same rate was 100% effective against ascarids and 50% effective against adult hookworms determined at necropsy. After a single dose of 160 mg. per lb. body-weight 33.3% of the treated dogs were free of hookworms and a single dog was cleared of ascarids. D.M.

(97b) The efficiency of cadmium oxide and cadmium anthranilate against swine ascarids was tested against that of sodium fluoride. Although the latter was more efficient as an anthelmintic the pigs disliked it and the subsequent lower food intake resulted in weight losses during the 48-hour treatment. D.M.

(97c) The incidence of gastro-intestinal parasites of cattle born and raised in South California, as ascertained by examination of faecal samples from 2,180 animals (out of an estimated total cattle population of 492,000), was: *trichostrongyles* 40%, *Strongyloides* 0.5%, *Nematodirus* 0.7%, *Trichuris* 1.2%, *Neoascaris* 0.1%, *Fasciola hepatica* 1.6% and *Moniezia* 3.2%. The trichostrongyle infections reached 77% in June. R.T.L.

(97d) No *Echinococcus granulosus* was found at necropsy on 70 dogs, or after arecoline hydrobromide treatment of 75 dogs. No hydatid was found at post-mortem on about 20,000 adult sheep in various parts of Iceland. *E. granulosus* is evidently now rare and may have been eradicated. [This note is published by Bush as a correction of his article which appeared in *J. Amer. vet. med. Ass.*, **128**, 329-331.] R.T.L.

(97e) In an unweaned lamb, three to four months old, which had failed to respond to treatment for tapeworm and had become moribund a thick rope of dead *Moniezia expansa*, numbering 251, was found at autopsy to occlude the intestine almost completely. The lamb was one of a flock of 135 of which six had died within two weeks. No other evidence was found to account for the animal's comatose condition. R.T.L.

(97f) Experiments showed that piperazine hexahydrate and piperazine glycolylarsanilate (glycopiparsol) were not effective against trichostrongyles, *Nematodirus*, *Strongyloides* and *Trichuris* in sheep; the latter drug is too toxic to justify any further testing as an anthelmintic. D.M.

(97g) Experiments on 22 pigs showed that the betaine of 1-piperazine carbodithioic acid (piperazine-carbon disulphide complex), given at the rate of 110 mg. per kg. body-weight, was 95-100% effective in eliminating *A. lumbricoides* var. *suis*. It was 100% effective when given at the rate of 125 mg. per kg. body-weight either when fed as a pure compound, or mixed with an inert carrier. The treatment also appeared to be effective against *Oesophagostomum dentatum*. D.M.

(97h) Piperazine adipate powder was successfully used as a vermifuge against ascar infections in 13 zebras. After fasting the animals for 24 hours the drug was given to them mixed with oats, at the rate of 220 mg. per kg. body-weight. Where the weight was uncertain the dosage used was 3 oz. for mature and 1½ oz. for immature animals. D.J.

(97i) A dog, with anorexia and persistent blood-stained diarrhoea due to *Balantidium* sp. and with a heavy infection with *Ancylostoma* sp. and *Trichuris vulpis*, was treated with n-butyl chloride for the hookworms and Whipcide for *T. vulpis*. All evidence of illness disappeared in seven days, the protozoan infection having apparently subsided after the elimination of the helminths. D.J.

98—Journal of Clinical Pathology. London.

- a. RIDLEY, D. S. & HAWGOOD, B. C., 1956.—“The value of formol-ether concentration of faecal cysts and ova.” 9 (1), 74-76.

(98a) The formol-ether method of concentrating helminth eggs in faeces is simplified as follows: “About 1 g. of faeces is thoroughly emulsified with about 7 ml. of 10% formal saline, and strained through wire gauze (40 mesh per inch) into a centrifuge tube. Ether, 3 ml., is added and the mixture shaken vigorously for one minute. It is then centrifuged, accelerating slowly and gradually over a period of two minutes to a speed of 2,000 r.p.m. and then allowed to come to rest. The debris on the surface and at the interface between the two liquids is loosened from the wall of the tube with a stick and the supernatant is decanted, the last drop or two being allowed to run back. The upper part of the tube is wiped clear of fatty debris. The small deposit is shaken up and poured on to a slide.” The concentration of eggs obtained is of the order of 20 to 30 times and distortion is completely absent. R.T.

99—Journal of Comparative Pathology and Therapeutics.

- a. KULASIRI, C. & SENEVIRATNE, R. D., 1956.—“*Gigantocotyle explanatum* Creplin (Trematoda: Paramphistomidae) infection of the liver of the buffalo in Ceylon.” 66 (2), 83-88.

(99a) Kulasiri & Seneviratne have studied the gross lesions and histopathology of the livers of buffaloes infected with *Gigantocotyle explanatum*. Most of the paramphistomes occurred in the bile-ducts although some were found in the liver substance and, occasionally, in the portal veins. Invasion of the bile-ducts appeared to be uniform throughout the liver but the gall-bladder, although thickened and fibrosed, never contained parasites. There was extraordinary muscular hypertrophy and sub-endothelial proliferation of vessels, particularly the hepatic arteries; this is attributed to hepatic hypertension caused by substances produced by the parasites or the wide-spread granulomatous lesions of the portal tract. The cirrhosis was of the monolobular type. Evidence indicated that there was a trans-peritoneal infective route. The authors consider *G. bathycotyle* and *Explanatum explanatum* synonyms of *G. explanatum*. S.W.

100—Journal of the Egyptian Medical Association.

- a. SHAKIR, M. H., 1956.—“Effect of storage on sodium-antimony III bis pyrocatechol di-sulphonate of sodium.” 39 (1), 24-30.
b. SOLIMAN, K. N., 1956.—“The occurrence of *Schistosoma bovis* (Sonsino, 1876) in the camel, *Camelus dromedarius*, in Egypt.” 39 (3), 171-181.
c. ZAHER, M. F., SAFWAT, M. M., FAWZI, R. M. & BADR, M. M., 1956.—“Bilharzia non obstructive spindle shaped ureter.” 39 (3), 213-219.

(100a) Shakir examined samples of fouadin and stibophen which, after storage, had become extremely toxic to human beings. Absorption curves were made with each sample and compared with the curves of freshly prepared solutions. With the samples, peaks occurred at different wave-lengths from the fresh solutions, and the curves were not as smooth and had several inflections. Toxicity tests were carried out on rats and Swiss mice; the dosage for mice was 4 c.c. of a 6.3% solution per kg. body-weight. All the control animals which received

fresh solutions of the drugs survived, but mortality ranged from 80% to 100% among the animals to which the stored drugs were administered. Shakir suggests that the toxic properties are the result of oxidation or decomposition of the original drug and concludes that even if the products cannot be identified chemically, their presence can be demonstrated by spectrophotometric techniques.

D.L.H.R.

(100b) *Schistosoma bovis* is reported as a parasite of the camel for the first time. At the Cairo Abattoir 10% of the camels imported from the Sudan were infected, mostly with the typical *S. bovis* described by Sonsino, 1876 and Khalil, 1924, while 25% of those locally bred had schistosomes which were mostly of the *S. matthei* variety. A number of variations in the eggs from both these varieties are illustrated. [Material on which this new record is based was demonstrated by Soliman at the Royal Society of Tropical Medicine in 1955, for abstract see Helm. Abs., 24, No. 164c.]

R.T.L.

101—Journal of Helminthology.

- a. METTRICK, D. F., 1956.—“A new trematode, *Reesella doviensis* gen. et sp. nov., from the oystercatcher, *Haematopus ostralegus occidentalis*, in Wales.” 30 (2/3), 81–86.
- b. LYNSDALE, J. A., 1956.—“On two new species of *Lytocestus* from Burma and the Sudan respectively.” 30 (2/3), 87–96.
- c. JAYEWARDENE, L. G., 1956.—“On a redescription of *Foleyella candezi* Fraipont, 1882, from Meller's chameleon (*Chamaeleon melleri*), from Nyasaland.” 30 (2/3), 97–102.
- d. SARWAR, M. M., 1956.—“On some spirurid and filariid nematodes of birds in Pakistan.” 30 (2/3), 103–112.
- e. WRIGHT, C. A. & SMITHERS, S. R., 1956.—“A new echinostome trematode, *Pameileenia gambiensis* gen. et sp. nov. from the intestine of a colubrid snake in West Africa.” 30 (2/3), 113–118.
- f. JENNINGS, J. B., 1956.—“A technique for the detection of *Polystoma integerrimum* in the common frog (*Rana temporaria*).” 30 (2/3), 119–120.
- g. ABDU, A. H., 1956.—“The use of di-n-butyl tin dilaurate for treatment of chickens experimentally infected with *Davainea proglottina*.” 30 (2/3), 121–128.
- h. SOULSBY, E. J. L., 1956.—“Studies on the serological response in sheep to naturally acquired gastro-intestinal nematodes. I. Preparation of antigens and evaluation of serological techniques.” 30 (2/3), 129–142.
- i. BROWN, E. B., 1956.—“Damage to henbane by stem eelworm *Ditylenchus dipsaci* (Kuhn, 1857) Filipjev, 1936.” 30 (2/3), 143–144.
- j. BROWN, E. B., 1956.—“A seed-borne attack of chrysanthemum eelworm (*Aphelenchoides ritzema-bosi*) on the annual aster (*Callistephus chinensis*).” 30 (2/3), 145–148.
- k. DINNIK, J. A., 1956.—“On *Ceylonocotyle scolicoelium* (Fischöeder, 1904) and its intermediate host in Kenya, East Africa.” 30 (2/3), 149–156.
- l. WINSLOW, R. D., 1956.—“Seasonal variations in the hatching responses of the potato-root eelworm, *Heterodera rostochiensis* Wollenweber, and related species.” 30 (2/3), 157–164.
- m. DORSMAN, W., 1956.—“A new technique for counting eggs of *Fasciola hepatica* in cattle faeces.” 30 (2/3), 165–172.
- n. BAER, J. G. & SANDARS, D. F., 1956.—“The first record of *Raillietina* (*Raillietina*) *celebensis* (Janicki, 1902), (Cestoda) in man from Australia, with a critical survey of previous cases.” 30 (2/3), 173–182.

(101a) A new trematode named *Reesella doviensis* n.g., n.sp. is described from the intestine of an oyster-catcher on the Dovey Estuary in Wales. The new genus appears to be an intermediate type of between *Ribeiroia* and *Psilostomum* and is placed in the *Psilostomatidae*. It is pointed out that *Ribeiroia* was provisionally put into *Cathaemasiinae* by Dollfus although it has close affinities with the genera of *Psilostomatidae*. As *Psilostomum progeneticum* and *P. varium* have characters considerably at variance with those of the genotype *P. brevicolle* the validity of their present position in the genus is questionable. It is suggested that *Psilostomum marilae* be removed to *Psilotrema* Odhner, 1913.

D.M.

(101b) *Lytocestus birmanicus* n.sp. from a silurid fish *Clarias batrachus*, in Rangoon, closely approximates to but is much smaller than *L. indicus*. The ovarian follicles, without exception, extend to the posterior level of the shell gland. In *Lytocestus alestes* n.sp., which is

based on a single specimen from *Alestes nurse*, a cyprinid fish in the Sudan, resembles *L. birmanicus* in these respects. But disparities in the measurements of the vitellaria and the shorter distance between the genital pores are held to justify the creation of this new species. R.T.L.

(101c) Jayewardene redescribes and figures *Foleyella candezi* from *Chamaeleon melleri* and tabulates the measurements of the body and oesophagus of the male and female and of the two spicules in comparison with those reported for *Filaria agamae* and *Foleyella pigmentata*. Although there is a difference in the ratio of the lengths of the short and long spicules and *F. pigmentata* has pigment in the cephalic region, while his material has none, *F. agamae* and *F. pigmentata* are considered to be synonymous with *F. candezi*. R.T.L.

(101d) The following nematodes are recorded in new avian hosts: *Hadjelia truncata* and *Dispharynx spiralis* from *Pica pica*; *Acuaria anthuris* from *Pastor roseus*, and *Acuaria brevispicula* and *Diplotrriaena nochii* from *Acridotheres ginginianus*. Their occurrence in Pakistan is reported for the first time. Maplestone's original description of *Acuaria brevispicula* is emended. The *Diplotrriaena tricusps* of Canavan (1932) and of Mazhar (1933), *D. acridotheres* Karve, 1934 and *D. nagpurensis* Karve, 1934 are considered to be synonyms of *D. nochii*. A new species of Histioccephalidae named *Stellocaronema buckleyi*, from the gizzard of the Indian Red-wattled Lapwing *Lobivanellus indicus* shot at Sheikhpura, Pakistan, differs from *S. skrjabini* in the length of the spicules (2.9 to 3.05 mm. and 0.95 to 1 mm.) and in the number of genital papillae of which there are two pairs of pre-anals, two pairs of post-anals and a double papilla just posterior to the cloaca. R.T.L.

(101e) *Pameileenia gambiensis* n.g., n.sp., from *Grayia tholloni* in the Gambia, belongs to the Echinostomatinae and differs from other genera of this subfamily by the extent of the vitellaria, which range from near the posterior end of the body to the level of the anterior testis, and by the presence of already embryonated eggs in the uterus; a condition which occurs only in *Pelmatostomum* from which the new genus can easily be distinguished by the absence of a dorsal cleft in the head collar and the limited extension of the cirrus pouch posteriorly. R.T.L.

(101f) As haematin is voided from the gut of *Polystoma integerrimum* into the bladder the presence of the trematode can be detected by testing a sample of urine for this pigment. When a small quantity of a solution containing luminal and hydrogen peroxide is added to the urine an intense blue luminescence will develop. D.M.

(101g) The efficacy of di-*n*-butyl tin dilaurate as a taeniocide was tested on eight-week-old chickens with experimentally controlled infections of *Davainea proglottina*. Birds receiving a dose of 1 ml. (or 0.5 ml. per kg. body-weight) contained no tapeworms at autopsy, whereas experimentally infected birds used as controls contained large numbers. R.T.L.

(101h) Nematodes were collected from freshly killed cattle and sheep and were divided into four groups: (i) abomasal parasites containing *Haemonchus contortus*, *Ostertagia* and *Trichostrongylus* spp., (ii) intestinal nematodes containing *Trichostrongylus* spp., *Cooperia curticei* and *Chabertia ovina*, (iii) *Cooperia oncophora* and (iv) *Bunostomum* spp. Antigens were prepared from each group by low temperature methods and an extract of whole female *Ascaris lumbricoides* was prepared in the same manner. Antisera against (ii), (iii) and *A. lumbricoides* were prepared in rabbits and sera were collected from naturally infected sheep. Control sera were obtained from worm-free lambs born by Caesarian section and before they had suckled their mothers. Complement fixation tests and passive haemagglutination tests were carried out; higher titres were obtained with the latter. The antigens showed a marked cross reactivity. Naturally infected sheep gave high antibody titres. All sheep showed a spring rise in egg count; there was a general rise in antibody titre before the spring rise and a very marked increase at the end of it. There appears to be a relationship between the antibody titre and the egg count. The techniques used are described in detail. S.W.

(101i) The author describes the symptoms of damage to henbane (*Hyoscyamus niger*) caused by *Ditylenchus dipsaci*. These resembled typical "tulip root" in oats. In host range tests with the nematode, symptoms of attack were shown by onions, field beans and S147 oats but broad red clover remained free. In 20 gm. of henbane seed four nematodes were found. The field infestation is considered to have come from the soil. M.T.F.

(101j) Annual asters (*Callistephus chinensis*) were severely attacked by *Aphelenchoides ritzema-bosi* which was found to be seed-borne. The nematodes were feeding mainly externally in the terminal buds causing scarred areas on petioles and midveins and distortion or complete abolition of the lamina. Later damage was internal, resulting in blotching and death of the leaves. From 14 gm. of seed more than 300 nematodes were recovered. M.T.F.

(101k) Dinnik records *Ceylonocotyle scoliocoelium* from Zebu cattle in Kenya. He describes his specimens in detail and illustrates the salient morphological characteristics, including the long oesophageal bulb and the genital sphincter muscle; the morphology agrees closely with Fiscoeder's original description, except that Dinnik's specimens are somewhat smaller, and with Näsmark's redescription. *Anisus natalensis* was found naturally infected with larval stages of *C. scoliocoelium* together with *Carmyerius exoporus* and *C. mancupatus*. S.W.

(101l) Two series of experiments were carried out to test the response of larvae of several species of *Heterodera* to hatching stimuli during the winter months. In the first series soil containing cysts of the species under investigation was removed from the field at intervals during the winter, air-dried for seven or three days, and the cysts recovered by flotation and incubated at 25°C. for three weeks in appropriate stimulant root diffusate. Larval hatch was estimated. In the other experiments the soil was removed from the field at the end of August, divided into eight lots and stored at 5°C., 10°C., 15°C., 20°C., 25°C. or at three different fluctuating temperatures. Hatching tests were carried out in the same way as before. When removed at intervals from the field cysts of *H. schachtii* showed little seasonal variation in hatch in the absence of new cysts, but when the population contained a proportion of new cysts there was some reduction in hatch during winter. In *H. cruciferae*, *H. carotae* and *H. rostochiensis* there was a marked seasonal decline in winter and partial dormancy was shown by *H. trifolii*, *H. galeopsidis* and *H. humuli*. Of the three species tested, after storage at constant or fluctuating temperatures, *H. rostochiensis* still showed marked dormancy but the period was shortened by storage at 25°C. *H. cruciferae* behaved similarly but appeared to become active later in spring than potato root eelworm. *H. schachtii* had a considerably less pronounced dormancy. Winslow concludes that winter dormancy occurs in varying degree in different species of *Heterodera* and that the nature of the dormancy is not wholly dependent on environment but may be induced by earlier conditions. Cessation of dormancy in spring is not necessarily associated with rise in soil temperature. M.T.F.

(101m) Dorsman describes a method by which eggs of *Fasciola hepatica* can be collected quantitatively from cattle faeces and transferred to a known volume of water. Addition of a carboxymethyl-cellulose solution ensures even distribution of the eggs within the counting chamber. He gives technical details for making the apparatus and the counting slide. He has demonstrated that the whole procedure, from putting the faecal sample on to the first sieve and including counting the eggs in both squares of the counting slide, takes about 15 minutes. The accuracy of the method was confirmed by adding known numbers of eggs to faecal samples. S.W.

(101n) Baer & Sandars have identified as *Raillietina* (R.) *celebensis* a number of gravid proglottides collected in Brisbane from the faeces of a child, 21 months old, and several complete tapeworms from *Rattus assimilis* from Mount Glorious in South Queensland. This is the first record of this tapeworm in man in Australia. R.T.L.

102—Journal of the Indian Medical Association.

- a. CHAKRAVARTI, S. N. & RASTOGI, A. K., 1956.—“Subdiaphragmatic abscess secondary to hydatid cyst of the liver.” **26** (4), 142-143.
- b. ALWA, R. V. K., 1956.—“Acute gangrenous appendicitis caused by round worms.” **26** (6), 235.
- c. CHOWDHURY, A. B., DASGUPTA, B., RAY, H. N. & BHADURI, N. V., 1956.—“Studies on the hexacanth embryo of *Taenia saginata* and its enclosing membranes.” **26** (8), 295-301.

(102c) Histological studies of oncospheres of *Taenia saginata* showed that the chorionic membrane is nucleated, usually having two nuclei, and contains polysaccharide granules. The basement membrane is cellular and, in the early stages, nucleated; besides lining the internal surface of the embryophore, it holds together the radial blocks of the embryophore by permeating the intervening radial canaliculi. No desoxyribonucleic acid was located outside the nuclei of the embryo. The oncosphere was connected to the basement membrane by one or more stalks and by strands rich in polysaccharides. Through these, it is suggested, the embryo receives nourishment. The large quantities of mucopolysaccharide found in the embryo may play a role in its defence mechanisms. M.MCK.

103—Journal of Infectious Diseases.

- a. COKER, C. M., 1956.—“Some effects of cortisone in mice with acquired immunity to *Trichinella spiralis*.” **98** (1), 39-44.
- b. NORMAN, L., DONALDSON, A. W. & SADUN, E. H., 1956.—“The flocculation test with a purified antigen in the diagnosis of trichinosis in humans.” **98** (2), 172-176.
- c. COKER, C. M., 1956.—“Cellular factors in acquired immunity to *Trichinella spiralis*, as indicated by cortisone treatment of mice.” **98** (2), 187-197.

(103a) Mice immunized against *Trichinella spiralis* were rendered non-immune when treated with cortisone and were unable to acquire the immunity which non-immunized mice ordinarily develop between the 11th and 14th day after *Trichinella* infection. R.T.L.

(103b) From comparison of the results obtained in 206 *Trichinella* patients it is suggested that the bentonite flocculation test could usefully be substituted for the complement fixation test for serological diagnosis of *Trichinella* infection in man. R.T.L.

(103c) The administration of cortisone to mice immunized against *Trichinella spiralis* almost completely prevented the usual cellular response of the intestine to this infection; eosinophils practically disappeared from the mucosa. These observations are in harmony with the hypothesis that the immunity mechanism in the mice is due primarily to specific antibodies with secondary cellular co-operation; the cellular factor being of the greater importance in effecting the elimination of the parasites from the small intestine. R.T.L.

104—Journal of the Louisiana State Medical Society.

- a. MCHARDY, G., MCHARDY, R. & BROWNE, D. C., 1956.—“The treatment of strongyloidosis with Win 5047. Preliminary report.” **108** (1), 27-28.

(104a) N-(2,4-dichlorobenzyl)-N(2-hydroxyethyl) dichloroacetamine, a non-metallic amoebicidal compound, has no direct effect on mobile rhabditiform larvae of *Strongyloides stercoralis* but 4,000 mg. given daily for twenty days to 27 patients, who had failed to respond to treatment with gentian violet, cleared the infection in six patients without recurrence and in seven with recurrence, but had no effect on 14 patients. As it proved more efficient and innocuous than gentian violet more extensive trials are advocated. R.T.L.

105—Journal of Parasitology.

- a. ROGERS, R. A., 1956.—“A study of eggs of *Ascaris lumbricoides* var. *suum* with the electron microscope.” 42 (2), 97–108.
- b. KRAUT, N., 1956.—“An electrophoretic study of sera from rats artificially infected with and immunized against the larval cestode *Cysticercus fasciolaris*.” 42 (2), 109–121.
- c. HANSEN, M. F., TERHAAR, C. J. & TURNER, D. S., 1956.—“Importance of the egg shell of *Ascaridia galli* to the infectivity of its larva.” 42 (2), 122–125.
- d. OLIVIER, L., 1956.—“Observations on vectors of schistosomiasis *mansoni* kept out of water in the laboratory. I.” 42 (2), 137–146.
- e. CHATTERJI, P. N., 1956.—“Studies on some diplostome trematodes of the sub-family Crassiphialini Dubois, 1936.” 42 (2), 147–150.

(105a) Rogers has studied *Ascaris* ova with the electron microscope and his observations confirm that the egg envelope is composed of an outer protein layer, a middle chitinous shell and an inner lipid layer. Limiting membranes border the protein coat and chitinous layer. The protein coat appears as dense reticulated material, the chitinous coat is composed of highly branched microfibrils and the lipid layer, in the living state, has a striated appearance. No structures were observed in the perivitelline space but large numbers of granules and vacuoles are located within a very coarse cytoplasmic reticulum inside the egg itself. Hyaline spheres were observed in immature eggs. The paper is illustrated with a number of photomicrographs. S.W.

(105b) Kraut analysed electrophoretically sera from rats experimentally infected with *Cysticercus fasciolaris*, artificially immunized with larval worm material and uninfected controls. The changes in the serum protein of infected rats were not specific, the significant quantitative differences which were observed being attributable to the involvement of the liver tissue and related to the degree of infection. No new components were obtained and there were no alterations in the component mobilities. Qualitative changes in the serum protein of infected and artificially immunized rats were observed. Attempts to determine the immunologically active protein component by electrophoretic analysis before and after absorption with worm material were unsuccessful. S.W.

(105c) Three groups of 14-day-old chicks were infected orally and three groups duodenally with *Ascaridia galli* by means of (i) normal ova, (ii) ova from which the shells had been removed and (iii) hatched larvae. Counts of worms recovered from the small intestine 21 days later indicated that hatched larvae or those surrounded only by the vitelline membrane had a much lower rate of survival when given orally than when injected into the duodenum. Normal ova were able to hatch when placed directly into the duodenum. S.W.

(105d) In north-eastern Brazil the schistosome vectors *Australorbis glabratus* and *Tropicorbis centimetralis* inhabit many streams and pools which contain water only in the wet season, between March or April to July or August. In laboratory experiments some *A. glabratus*, collected from dry habitats, placed in shallow unglazed jars without water and in relative humidities of 70% to 95%, survived for 207 days. When collected from water they lived for 285 days. *T. centimetralis* from dry habitats lived 14 months and from water 109 days. Different strains within the two species varied in their ability to survive. No evidence was obtained that the snails could withstand severe desiccation. [The text of p. 138 of this paper evidently became badly disarranged while passing through the press. The correct version is printed under *Errata* at the end of the succeeding number of *J. Parasit.*, i.e. 42 (3).] R.T.L.

(105e) Chatterji retains in Crassiphialini the genera *Uvulifer* and *Pseudodiplostomum* as valid and distinct from *Crassiphiala*. *C. stunkardi* Panda, 1938 is transferred to *Uvulifer*. *Uvulifer mehrai* Chatterji, 1950 and *Allodiplostomum fuscai* Chatterji, 1950 both from *Halycon smyrnensis fusca* are redescribed and figured. R.T.L.

105—Journal of Parasitology (cont.)

- f. SHUMARD, R. F. & EVELETH, D. F., 1956.—“A practical method for raising lambs ‘parasite free’ while allowing them to remain with their ewes.” 42 (2), 150.
- g. NAGATY, H. F., 1956.—“Trematodes of fishes from the Red Sea. Part 6. On five distomes including one new genus and four new species.” 42 (2), 151–155.
- h. HALL, J. E. & SONNENBERG, B., 1956.—“An apparent case of human infection with the whipworm of dogs, *Trichuris vulpis* (Froelich, 1789).” 42 (2), 197–199.
- i. SOGANDARES-BERNAL, F., 1956.—“Four trematodes from Korean bats with descriptions of three new species.” 42 (2), 200–206.
- j. JONES, A. W. & CIORDIA, H., 1956.—“The chromosomes of *Hydatigera taeniaeformis* and *Taenia pisiformis*.” 42 (2), 207.

(105f) Lambs can be kept free from parasites (except *Strongyloides papillosus*) if the ewes are drenched with 25 gm. phenothiazine and all soiled wool is removed one month before lambing, and they are then given 1.5 gm. to 2.0 gm. of phenothiazine daily in their feed. One pint of a 3.45% solution of sulphadoxine is added to 50 gallons of drinking water. All animals are kept in concrete pens on straw bedding. S.W.

(105g) Nagaty describes and figures four new distomes from the Red Sea. The sphincterostomatid, *Megacreadium tetrodonis* n.g., n.sp., was found in *Tetrodon* sp. and, like *Sphincterostoma*, has muscular pre-oral lobes, a cellular oral sucker and no cirrus sac, but there are eight testes and the caeca open through ani while *Sphincterostoma* has two testes and the caeca join the excretory vesicle. *Phyllodistomum leilae* n.sp. from *Pseudoscarius harid* is characterized by a very short oesophagus, irregularly constricted caeca and a sucker ratio of 1:0.88. It is nearest to *P. pacificum*. *Histerolecitha teuthis* n.sp. from *Teuthis marmorata* differs from *H. lintoni* in the size of the eggs, which are 0.036 × 0.021 mm. in *H. teuthis* and 0.023–0.027 × 0.0076–0.01 mm. in *H. lintoni*. The egg size and sucker ratio (1:1.5) also distinguish the new species from *H. nakaensis* and *H. microrchis*. *Tubulovesicula serrani* n.sp. from *Serranus* sp., with the ecsoma equal in length to the body, is similar to *T. anguillae*, but in the new species the pars prostatica is shorter than the seminal vesicle, the uterus only just enters the ecsoma and the eggs measure 0.027 × 0.020 mm. In each case the new species are described from one specimen only. *Helicometra hypoditis* is recorded for the first time from *Serranus* sp. in the Red Sea. G.I.P.

(105h) Large *Trichuris* eggs, measuring on an average 82 μ by 38 μ, and part of one female worm were recovered from the faeces of a boy in Maryland and were tentatively identified as *T. vulpis*. G.I.P.

(105i) Three new trematodes are described from Korea. *Prosthodendrium thomasi* n.sp. from *Vespertilio superans* is characterized by its body length of 0.224–0.356 mm., the sucker ratio of 1:0.79–0.85, very short caeca, post-testicular vitellaria and eggs measuring 34 μ to 35 μ by 18 μ to 22 μ. *Acanthatrium macyi* n.sp. from *Pipistrellus* sp. is distinguished from *A. alicatai* by the body size of 0.81–0.96 mm. by 0.42–0.48 mm. and the size of the eggs (28 μ by 14 μ), and from *A. pipistrelli* by shorter (7–8 μ) atrial spines, a longer oesophagus and the 1:0.47–0.78 sucker ratio. *A. jonesi* n.sp. from *V. superans* possesses acetabular lobes and thus differs from all other species of this genus. *Acanthatrium chosenicum* n.comb. is made for *Lecithodendrium chosenicum* Ogata, 1940. *Mesothatrium*, a subgenus of *Acanthatrium*, is raised to generic rank and *A. (M.) japonicum* becomes its type species. A description of *Plagiorchis vespertilionis* from both bats is given and Strom & Sondak's specimen of this species is considered synonymous with *P. koreanum*. *P. magnacorylus* Park, 1939 and *P. eptesici* Ogata, 1940 are made synonyms of *P. vespertilionis*. G.I.P.

(105j) Jones & Ciordia have studied the chromosomes of *Hydatigera taeniaeformis* and *Taenia pisiformis* using Schreiber's feulgen-aceto-carmin method. Those of *H. taeniaeformis* number 16 diploid and range in size from 1 μ to about 2 μ while those of *T. pisiformis* number 20 diploid and are somewhat larger. S.W.

105—Journal of Parasitology (cont.)

- k. WEINSTEIN, P. P. & JONES, M. F., 1956.—“The *in vitro* cultivation of *Nippostrongylus muris* to the adult stage.” 42 (3), 215–236.
- l. KAGAN, I. G. & BARGAI, U., 1956.—“Studies on the serology of trichinosis with hemagglutination, agar diffusion tests and precipitin ring tests.” 42 (3), 237–245.
- m. CRUSZ, H., 1956.—“The progenetic trematode *Cercaria patialensis* Soparkar in Ceylon.” 42 (3), 245.
- n. NEWTON, W. L. & WRIGHT, W. H., 1956.—“The occurrence of a dog filariid other than *Dirofilaria immitis* in the United States.” 42 (3), 246–258.
- o. RAUSCH, R., BABERO, B. B., RAUSCH, R. V. & SCHILLER, E. L., 1956.—“Studies on the helminth fauna of Alaska. XXVII. The occurrence of larvae of *Trichinella spiralis* in Alaskan mammals.” 42 (3), 259–271.

(105k) Weinstein & Jones have succeeded in cultivating *Nippostrongylus muris* under axenic conditions *in vitro* to the adult stage. Free-living stages were obtained from petri dish cultures of heavily infected rat faeces mixed with charcoal. The larvae were isolated from the cultures in 0.7% saline with a Baermann apparatus, washed with dilute hypochlorite solution and cultured in roller tubes containing a 10% chick embryo extract to which antibiotics had been added to give a concentration of 300 units of penicillin and 0.3 mg. of streptomycin per ml. of medium. In this medium, the growth and development of the larvae attained that of the advanced lung stage. Further development to the sexually mature adult followed only when the embryo extract was supplemented by a combination of caseinate, liver extract and rat serum. The adult worms thus obtained were definitely smaller than those present in wild rats, the males ranging from 1.8 to 2.4 mm. and the females from 2.1 to 2.5 mm. in length. This stunting is likened to that of *N. muris* in immunized normal hosts and in various abnormal hosts. R.T.L.

(105l) Using Boyden's haemagglutination test for the detection of antibody in the sera from rabbits infected with *Trichinella spiralis* and sheep red cells coated with Melcher's acid-soluble larval antigen, positive results were obtained 6 to 15 days after infection. This test was more sensitive in detecting antibody in positive rabbit and rat sera and gave results earlier in the infection than the precipitin tests with Melcher's antigen. Melcher's antigen detected antibody earlier than saline extracts of *Trichina* larvae. Agar double diffusion tests showed that Melcher's antigen is composed of at least three antigenic components. R.T.L.

(105m) The progenetic and protandrous larval trematode *Cercaria patialensis* Soparkar, 1924, occurred almost all the year round in about 4% of *Melanoides tuberculata*, in paddy-fields in Godapola, near Peradeniya. Cruz notes that the ovary of this cercaria is on the left side just in front of the left testis, and so confirms Soparkar's original description of the genitalia rather than Anantaraman's redescription in 1948 [for abstract see Helm. Abs., 17, No. 302b]. The latter's suggestion that the final host may be a duck appears to be of little significance since ducks are absent in the Ceylonese locality. From other evidence, including that of the relationship of this cercaria to *Transversotrema haasi* Witenberg, 1944, it seems more probable that the final host is a fresh-water fish. H.C.

(105n) The microfilaria of a species of *Dipetalonema* occurs in the peripheral blood of dogs in Virginia, Maryland, Pennsylvania and New Jersey. It is considerably shorter and narrower than that of *Dirofilaria immitis* and the nerve ring, excretory cell and G cells differ in their position. The microfilaria develops to the infective stage in the body-cavity of *Ctenocephalides canis* and *C. felis* but not in *Anopheles quadrimaculatus*. The adults live in the subcutaneous tissues. The male is about 17 mm. long and the female about 32 mm. long. [They have not yet been identified.] R.T.L.

(105o) Samples, chiefly of diaphragm, from 2,433 Alaskan mammals representing 42 species, were artificially digested and examined for *Trichinella spiralis*. Larvae were present in 11.7%. Infection was found in the following 23 species: *Ursus arctos*, *U. americanus*, *Thalarchos maritimus*, *Canis familiaris*, *C. latrans*, *C. lupus*, *Vulpes v. alascensis*, *Alopex lagopus*, *Mustela erminea arctica*, *M. rixosa eskimo*, *Gulo gulo*, *Felis lynx canadensis*, *Lepus americanus*

105—Journal of Parasitology (cont.)

- p. OLIVIER, L. & BARBOSA, F. S., 1956.—“Observations on vectors of schistosomiasis mansonii kept out of water in the laboratory. II.” **42** (3), 277–286.
- q. WELLS, W. H. & RANDALL, B. H., 1956.—“New hosts for trematodes of the genus *Heterophyes* in Egypt.” **42** (3), 287–292.
- r. MILLEMANN, R. E., 1956.—“Notes on the genus *Hexostoma* (Monogenea: Hexostomatidae), with a redescription of *H. euthynni* Meserve, 1938.” **42** (3), 316–319.
- s. FARR, M. M. & BLANKEMEYER, V. G., 1956.—“*Trichobilharzia brantae* n.sp. (Trematoda: Schistosomatidae) from the Canada goose (*Branta canadensis* L.)” **42** (3), 320–325.
- t. ROBINSON, Jr., E. J., 1956.—“Two flukes, *Phagicola macrostomus* n.sp. and *Phagicola byrdi* n.sp., from the turkey vulture (Trematoda: Heterophyidae).” **42** (3), 326–331.

dalli, *Citellus undulatus*, *Tamiasciurus hudsonicus*, *Lemmus sibiricus trimucronatus*, *Clethrionomys rutilus davosoni*, *Microtus miurus muriei*, *Ondatra zibethica*, *Castor canadensis*, *Delphinapterus leucas*, *Phoca* spp. and *Erignathus barbatus*. The presence of trichina larvae in some hares and other herbivorous animals is probably due to their feeding on carrion. Intradermal tests were made on a number of Eskimo, 21 out of 232 on St. Lawrence Island and 20 out of 71 at Wainwright were positive. Of 17 at Anaktuvuk Pass one was positive.

R.T.L.

(105p) In a series of laboratory experiments uninfected *Tropicorbis centimetralis* and *Australorbis glabratus*, the molluscan hosts of *Schistosoma mansoni* in north-eastern Brazil, survived out of water for many weeks when put on mud or in shallow water and allowed to dry gradually. Some lived for over a year. Most of them remained on the surface. Those embedded in dry soil lived as long as those on the soil surface, but if embedded in saturated mud they died in a short time.

R.T.L.

(105q) New hosts are reported for each of the three Egyptian species of *Heterophyes*, viz., *Felis chaus nilotica*, *Vulpes v. aegyptiaca* and *Canis aureus lupaster* for *Heterophyes heterophyes*; *Rattus rattus*, *Felis chaus nilotica* and *Canis aureus lupaster* for *H. aequalis* and *Felis chaus nilotica*, *Canis aureus lupaster*, *Vulpes v. aegyptiaca* and *Milvus migrans aegyptius* for *H. dispar*. Experimental feeding of puppies with *Sciaena aquilla* and *Solea vulgaris* proved, for the first time, that these two fishes were naturally infected with the metacercariae of all the three species of *Heterophyes*.

R.T.L.

(105r) The genus *Hexostoma* is reviewed with a key for the 8 species now considered valid, *H. macracanthum* Fujii, 1944, having been made a synonym of *H. euthynni* Meserve, 1938, for which *Euthynnus lineatus* is recorded as a new host.

R.T.L.

(105s) *Trichobilharzia brantae* n.sp. causes fatal illness in Canada geese in their overwintering grounds. It differs from all other species of the genus, except *T. stagnicolae*, in that the gynaecophoric canal has a relatively non-muscular anterior portion and a muscular posterior portion and only the posterior third of the muscular portion is lined with spines. Unlike *T. stagnicolae* its acetabulum is large and cup-shaped and the caecal union is on a level with that of the seminal vesicle.

R.T.L.

(105t) Two new heterophyids of the genus *Phagicola* are described and figured, each from a single specimen, from the intestine of *Cathartes aura* in Baker County, Georgia. *Phagicola macrostomus* n.sp. differs from other species found in the Western Hemisphere by the larger size of the oral sucker. The oral spines are either half as long or two to four times as long and the anterior half of the body is much broader. *Phagicola byrdi* n.sp. has a very long recurved oral diverticulum. The acetabulum is asymmetrically placed and is associated with a prominent gonotyl. The turkey vulture is probably an unusual host as phagicolids are usually found in fish-eating animals.

R.T.L.

105—Journal of Parasitology (cont.)

- u. BOYD, E. M., DIMINNO, R. L. & NESSLINGER, C., 1956.—“Metazoan parasites of the blue jay, *Cyanocitta cristata* L.” 42 (3), 332–346.
- v. NICHOLS, R. L., 1956.—“The etiology of visceral larva migrans. I. Diagnostic morphology of infective second-stage *Toxocara* larvae.” 42 (4), 349–362.
- w. NICHOLS, R. L., 1956.—“The etiology of visceral larva migrans. II. Comparative larval morphology of *Ascaris lumbricoides*, *Necator americanus*, *Strongyloides stercoralis* and *Ancylostoma caninum*.” 42 (4), 363–382, 383–399.
- x. RENDTORFF, R. C., 1956.—“Treatment of a case of *Taenia saginata* infection with diphenhydramine.” 42 (4), 382.
- y. LEIGH, W. H. & HOLLIMAN, R. B., 1956.—“The life-history of *Paramacroderoides echinus* Venard, 1941, a trematode of the Florida gar, *Lepisosteus platyrhincus*.” 42 (4), 400–407.
- z. FRANDSEN, J. C., 1956.—“*Ophiotaenia filaroides* La Rue, 1909 (Cestoda: Proteocephalidae) reported from Utah salamanders.” 42 (4), 413.

(105u) Sixteen species of helminths, viz., four Trematoda, two Cestoda and ten Nematoda were collected from 94 blue jays, *Cyanocitta cristata*, in New England. These, with additional data from the files of the Helminthological Collection of the United States Department of Agriculture and from the literature, bring the total up to 21 species. The incidence percentages in the blue jay and in the eastern crow and the starling are tabulated: the most striking difference being the paucity of cestodes in the blue jay (2.1%) as compared with their prevalence in the crows (40%) and starlings (71%). New host records for the blue jay are *Lutztrema monenteron*, *Oligorchis* sp., *Dispharynx nasuta*, *Capillaria contorta*, *C. obsignata*, *Pseudoprocta* sp., *Acuaria anthuris*, *Splendidofilaria* sp. and *Diplotrriaena tricuspsis* which was found in 30.9% of the birds examined. R.T.L.

(105v) Except for a slight development in the excretory cell, the larvae of *Toxocara canis* and *T. cati* do not undergo any development in the tissues of experimentally infected mice and can only be distinguished by the constant difference in their equatorial width. In *T. canis* it is 18 μ or over, whereas in *T. cati* it never exceeds 17 μ . *T. canis* larvae recovered from human infections are identical with those found in the mouse. R.T.L.

(105w) Following a detailed and illustrated description of the larvae of *Ascaris lumbricoides*, *Necator americanus*, *Ancylostoma caninum* and *Strongyloides stercoralis* recovered from the tissues, Nichols gives a key for the specific differentiation, from transverse sections, of the larvae at mid-gut level based on the diameter, presence or absence of alae, presence and size of (or lack of) excretory columns, and on the diameter of the mid-gut. It is suggested that infection with *A. caninum* larvae may be a factor in the aetiology of tropical eosinophilia. R.T.L.

(105x) A patient with *Taenia saginata* infection which had resisted earlier treatments with *Aspidium* oleoresin and atebirin was cured in seven days by Benadryl emplets in consecutive doses of 50, 150, 150, 200, 250, 300, 300 and 200 mg. He received Seidlitz powder as a purge two hours after the last dose. R.T.L.

(105y) The eggs of *Paramacroderoides echinus* in the Florida gar *Lepisosteus platyrhincus* are embryonated when deposited, but do not hatch until eaten by *Helisoma duryi*. In this mollusc daughter sporocysts produce large xiphidiocercariae of the *ornata* group, in which the number of penetration glands on the two sides of the body is unequal. The cercariae penetrate and encyst in tadpoles, frogs and several genera of small fishes. When exposed experimentally to sufficient numbers *Gambusia* died with corneal damage, frayed fins, sloughing of the integument over areas of penetration and haemorrhages, often massive, in the muscles. It is, however, doubtful if these cercariae are a significant factor in the mortality among small fishes in nature. R.T.L.

(105z) This is the first report of the occurrence of plerocercoids and young adults of *Ophiotaenia filaroides* in *Ambystoma tigrinum* in Dog Lake, at 8,000 feet, on the Wasatch Mountains in Utah. R.T.L.

105—Journal of Parasitology (cont.)

- ba. OGREN, R. E., 1956.—"Development and morphology of the oncosphere of *Mesocostoides corti*, a tapeworm of mammals." 42 (4), 414-428.
- bb. MATHIES, JR., A. W. & CORT, W. W., 1956.—"Larval trematode infections in snails of different sizes." 42 (4), 429-431.
- bc. HILL, C. H., 1956.—"*Trichinella spiralis* from the urinary bladder of a pig." 42 (4), 434.
- bd. HOFFMAN, G. L., 1956.—"The life cycle of *Crassiphiala bulboglossa* (Trematoda: Strigeida). Development of the metacercaria and cyst, and effect on the fish hosts." 42 (4), 435-444.
- be. KUNTZ, R. E. & CHANDLER, A. C., 1956.—"Studies on Egyptian trematodes with special reference to the heterophyids of mammals. I. Adult flukes, with descriptions of *Phagicola longicollis* n.sp., *Cynodiplostomum namrui* n.sp., and a *Stephanoprora* from cats." 42 (4), 445-459.
- †bf. KATZ, F. F., 1956.—"The effect of irradiation on reproduction by the heterogenetic generations of *Strongyloides papillosus* (Wedl, 1856) Ransom, 1911." 42 (4, Sect. 2), 11.

(105ba) Ogren describes and illustrates the oogenesis, cleavage and cellular differentiation of the embryo and the structure of the oncosphere of *Mesocostoides corti*, taken from *Procyon lotor* caught at Havana, Illinois.

R.T.L.

(105bb) The number of trematode germinal sacs developing in the molluscan intermediate host increases with the size of the mollusc. The ability of the smaller snails to limit production is an adaptation very favourable to the persistence of the trematode species concerned, but the mechanism is difficult to understand. The number of daughter rediae of *Echinoparyphium recurvatum* found in the largest specimen of *Bulinnea megasoma* was almost forty times as great as in the small *Fossaria abrusa*.

R.T.L.

(105bc) A normal *Trichinella spiralis* female containing partially developed embryos was found in the lumen of the urinary bladder of a young pig which had been given about 26,000 infective larvae 54 days prior to autopsy. As the bladder was the first organ to be removed there was no opportunity of contamination. No larvae were present in any of the other organs and tissues not containing striated muscle.

R.T.L.

(105bd) Hoffman describes the egg and miracidium of *Crassiphiala bulboglossa* and its development in sporocysts in *Helisoma anceps* and *H. trivolvis*. The eleven species belonging to six families of fishes in which the metacercariae are now known to encyst are listed. He doubts if naturally acquired infections are lethal although large numbers are so under experimental conditions. When fish were reinfected with numerous metacercariae no evidence of immunity was obtainable.

R.T.L.

(105be) Ten heterophyids were identified in a collection made in lower Egypt from 48 cats, three dogs, one fox, two shrews, one rat, five kites, one osprey and one domestic duck. Their hosts, geographical locality and incidence are tabulated. *Phagicola longicollis* n.sp. from the domestic cat is similar to *P. longa* but differs in that the pharynx is considerably further from the anterior end and the ventral sucker is on the average 70% of the body length from the anterior end. The ventral sucker is round not oval and the oral sucker is armed with 14 or 15 but not 16 spines as in *P. longa*. *Cynodiplostomum namrui* n.sp. in cats and dogs differs from *C. azimi* only in that the hold-fast organ is broadly oval and not round and is not particularly small. *Mesostephanus appendicularis*, which is common in dogs and cats and occurred once in a fox, is now reported from Egypt for the first time.

R.T.L.

(105bf) Exposure of sperm and ova of *Strongyloides papillosus* to Cobalt-60 gamma radiation and to X-rays failed to induce the production of successive free-living generations. Bisexual cultures containing irradiated fourth and fifth-stage males produced fewer offspring than those containing third or fourth-stage females. The percentages of eggs hatching and of the larvae which survived decreased with increased doses of irradiation. Irradiation delayed cleavage rate and embryogenesis. Spermatozoa in uteri were active 5 hours after 20 kr. exposure. Increased dosage increased the lethal effects. Killing effects occurred in gravid females and bisexuals at 20 kr.

R.T.L.

†Abstract of paper presented at the 31st Annual Meeting of the American Society of Parasitologists, Storrs, Connecticut, August 26-29, 1956.

5—Journal of Parasitology (cont.)

- †bg KAGAN, I. G., 1956.—“Agar diffusion studies with ascarid antigens.” 42 (4, Sect. 2), 11.
- †bh SADUN, E. H., ALLAIN, D. & HEIMLICH, R., 1956.—“A rapid and accurate nephelometric method for the quantitative determination of helminth eggs in clear suspensions.” 42 (4, Sect. 2), 11–12.
- †bi FAIRBAIRN, D. & PASSEY, R. F., 1956.—“The distribution and function of glycogen and trehalose in developing eggs of *Ascaris lumbricoides*.” 42 (4, Sect. 2), 12.
- †bj WALLACE, W. S., HEWITT, R. I., TAYLOR, Jr., L. H. & WALETZKY, E., 1956.—“Effects against dog ascarids of low daily doses of Caricide^R in the feed.” 42 (4, Sect. 2), 12.
- †bk EHRENFORD, F. A., 1956.—“Canine ascariasis—a potential zoonosis.” 42 (4, Sect. 2), 12–13.
- †bl HEADLEE, W. H., VAJRASTHIRA, S. & MAIPHOOM, C., 1956.—“Data on the incidence of pinworm infection in Thailand.” 42 (4, Sect. 2), 13.

(105bg) Kagan has used a double diffusion agar technique to study the nature and specificity of ascarid antigens. Antisera were prepared in rabbits by injecting lyophilized *Ascaris lumbricoides* from both man and pig, *Toxocara canis* and *T. felis*. Homologous antigens and, in addition, antigens from cuticle, muscle, enteric fluid, embryonated and non-embryonated ova, and the polysaccharide fraction of pig ascaris were prepared. With full strength pig ascaris antiserum the numbers of distinct antigen-antibody bands observed were: homologous whole worm antigen and enteric fluid, nine; human ascaris and polysaccharide fraction, seven; muscle, cuticle, non-embryonated ova and cat ascaris, six; dog ascaris, five; embryonated ova, two. Some of the antibodies were present in high concentrations. Absorption studies were also made. R.T.L.

(105bh) There is a linear relationship between the concentration of *Ascaris* eggs in clear suspensions in 33% of glycerol in distilled water and nephelometric readings. Each nephelometric unit corresponded to approximately 60 eggs per ml. The variability was directly proportional to the egg concentration. The average time occupied was about 30 seconds, while egg counting took from 5 to 15 minutes. Nephelometric estimates are more rapid and more accurate than egg counts in clear suspensions. R.T.L.

(105bi) The fertilized *Ascaris* egg contains large amounts of carbohydrate in the form of glycogen and trehalose in equal proportions. These decrease by 50% during development to the vermiform stage but as the infective stage is maturing they are resynthesized to their original levels by the oxidation of the neutral fats in the egg. Within the infective egg the glycogen occurs in the embryo and the trehalose in the perivitelline fluid. While the glycogen serves as a source of energy for the hatched larva, the trehalose possibly maintains a high osmotic pressure in the hatching egg. R.T.L.

(105bj) Daily doses containing 5 mg. per kg. body-weight of the base equivalent of caricide completely prevented the development of *Toxocara canis* and *Toxascaris leonina* in experimentally infected puppies, although an eosinophilia developed. As these results were better than those obtained when 25 times the amount of piperazine hexahydrate was added to the food, the anti-ascarid effect of caricide is not a direct function of its piperazine content. R.T.L.

(105bk) Beaver's opinion that *Toxocara canis* is the principal aetiological agent in visceral larva migrans in man is said to be supported by the finding of the eggs of this species in 21% of 1,465 dogs. The incidence of infection in male dogs was 32.8% whereas in female dogs it was only 9.4%. Male dogs up to 36 months of age showed no immunity, whereas female dogs shows a marked and increasing immunity from 6 to 36 months of age. R.T.L.

(105bl) Examination of 270 children in a private school in Bangkok, by the cellulose adhesive tape method, gave 73.3% positive for *Enterobius vermicularis*, 0.4% for *Taenia* spp., 0.4% for *Trichuris trichiura* and 16.7% for *Ascaris lumbricoides*. R.T.L.

†Abstract of paper presented at the 31st Annual Meeting of the American Society of Parasitologists, Storrs, Connecticut, August 26–29, 1956.

105—Journal of Parasitology (cont.)

- †bm. SHUMARD, R. F., 1956.—“The anthelmintic activity of powdered and liquid Parvex against *Ascaridia galli* and *Heterakis gallinae*.” 42 (4, Sect. 2), 13.
- †bn. HUSSEY, K. L., 1956.—“*Syphacia muris* and its distribution.” 42 (4, Sect. 2), 13–14.
- †bo. THORSON, R. E., 1956.—“The stimulation of acquired immunity in dogs by injections of extracts of the esophagus of adult hookworms.” 42 (4, Sect. 2), 14.
- †bp. WEINSTEIN, P. P. & JONES, M. F., 1956.—“The effects of vitamins and protein hydrolysates on the growth *in vitro* of the free-living stages of *Nippostrongylus muris* under axenic conditions.” 42 (4, Sect. 2), 14.
- †bq. TINER, J. D., 1956.—“Anti-trichostrongyle activity of phenothiazine demonstrated *in vitro*.” 42 (4, Sect. 2), 14–15.
- †br. HERLICH, H., 1956.—“Observations on age resistance of cattle to parasitic nematodes.” 42 (4, Sect. 2), 15.
- †bs. LEVINE, N. D., BRADLEY, R. E., CLARK, D. T. & KANTOR, S., 1956.—“The relationship of semi-weekly pasture rotation to acquisition of gastrointestinal nematodes by sheep.” 42 (4, Sect. 2), 15.

(105bm) In experimentally infected chickens liquid and powdered Parvex (piperazine-carbodithioic betaine) are both effective against *Ascaridia galli* at doses as low as 75 mg. per kg. body-weight, but even 225 mg. per kg. is not effective against *Heterakis gallinae*. R.T.

(105bn) The eggs of *Syphacia* from albino mice differ in size and shape from those from albino rats. The former are identified as *S. obvelata* and the latter as *S. muris*. Yonkers & Maplestone's figures of egg and adult are those of *S. muris*. R.T.

(105bo) Several days after extracts of the oesophagus of *Ancylostoma caninum* had been injected into puppies, 250 infective larvae of *A. caninum* were subcutaneously injected. The adult worms which resulted were fewer and smaller than those which developed in the controls, indicating that antibodies to the oesophageal extracts were formed and inhibited the development of the challenge infection of larvae. R.T.

(105bp) Larvae of *Nippostrongylus muris* do not develop to the filariform stage in 50% chick embryo extract dialyzed against Tyrode solution whereas a nondialyzed extract gives high yields. The addition of a mixture of acid-hydrolyzed casein and water-soluble vitamins to the extract enables the larvae to attain the filariform stage but at a reduced level. In a 50% chick embryo, diluted by steps in Tyrode solution, the yield of filariform larvae decreased sharply. In 12.5% extract only 1.7% of the larvae developed; but with the addition of the same mixture 63% reach the filariform stage, indicating that the loss of vitamins by dilution is one of the most important factors limiting growth. R.T.

(105bq) Eggs of *Obeliscoides cuniculi* and *Trichostrongylus calcaratus* from rabbit faeces were incubated at 20°C. in distilled water containing one µgm. per ml. of once-recrystallized phenothiazine. Although cell division continued for a time, gastrulation and organogenesis were inhibited and only malformed embryos had formed after 24 hours. In rotenone first stage larvae developed but did not hatch. R.T.

(105br) Three 18-month-old steers and three 5-month-old steer calves, raised helminth-free, were grazed on a green oats pasture which had been contaminated by spreading manure containing trichostrongyle and *Ostertagia* ova. When slaughtered 51 days later the young animals harboured 2½ times more worms than the older animals. R.T.

(105bs) In a rotation experiment during the grazing season between 4th May and 20th October, nine ewes and nine lambs were moved twice weekly through a series of fescue and lucerne pastures and the same number of ewes and lambs were kept on a pasture, without rotation, as controls. On 24th August, the mean egg counts per gramme of faeces reached the peak of 2,294 in the rotated ewes, 650 in the control ewes, 27,961 in the rotated lambs.

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5—Journal of Parasitology (cont.)

- †bt. CROSS, Jr., J. H. & SCOTT, J. A., 1956.—“Natural immunity of the white rat to the mouse parasite *Nematospiroides dubius* Baylis, 1926 (Nematoda: Heligmosomidae).” 42 (4, Sect. 2), 15–16.
- †bu. SCOTT, J. A. & MACDONALD, E. M., 1956.—“Immunity of challenging infections of *Litomosoides carinii* produced by transfer of developing worms.” 42 (4, Sect. 2), 16.
- †bv. PISTEY, W. R., 1956.—“Studies on the mosquito transmission of *Dirofilaria tenuis* Chandler, 1942.” 42 (4, Sect. 2), 16.
- †bw. GOLDBERG, E. & NOLF, L. O., 1956.—“Observations on the cytochrome system in *Trichinella spiralis*.” 42 (4, Sect. 2), 16.
- †bx. SADUN, E. H. & NORMAN, L., 1956.—“The use of metabolic antigens in the flocculation test for studying the serological response of rabbits to graded infections with *Trichinella spiralis*.” 42 (4, Sect. 2), 17.
- †by. SADUN, E. H., NORMAN, L. & BROOKE, M. M., 1956.—“The antibody response in rabbits to the intestinal and to the extra-intestinal phases of infections with *Trichinella spiralis*.” 42 (4, Sect. 2), 17.

and 8,406 in the control lambs. Thereafter, all the egg counts decreased rapidly and spontaneously until on 20th October the mean egg counts per gramme were in the rotated ewes 13, in the control ewes 350, in the rotated lambs 2,086 and in the control lambs 2,950. Two of the rotated lambs died of parasitism. The mean weights at the beginning of the experiment were in the rotated lambs 25.5 lb. and in the control lambs 26.4 lb. and on the 4th October 19.2 lb. in the remaining rotation lambs and 76.6 lb. in the control lambs. R.T.L.

(105bt) Ehrenford's observation that the laboratory mouse can serve as a normal host for *Nematospiroides dubius* from *Peromyscus* is confirmed. The larvae after encysting in the intestinal wall re-enter the lumen as young adults and lay eggs on about the ninth day. In white rats, however, the larvae were still encysted on the 10th day and showed signs of disintegration but, when cortisone was injected daily, worms matured and laid eggs only a few days later than in the mouse. R.T.L.

(105bu) Cotton-rats received into the peritoneal cavity three weekly transfers of 187–226 *Litomosoides carinii* which had developed seven days in donor cotton-rats. Challenging infections a month later showed retarded growth but when in a second experiment 132–154 worms were used no immunizing effect was apparent. R.T.L.

(105bv) The microfilariae of *Dirofilaria tenuis* develop readily in the Malpighian tubules of *Aedes taeniorhynchus* and infective larvae appear in the proboscis in 10 to 12 days. During the summer of 1954–55 1.6% of the *A. taeniorhynchus* caught in Longboat Key, Florida, showed similar developmental forms in the Malpighian tubules. The mortality was higher in the mosquitoes fed on infected raccoons at midnight than in the daytime. R.T.L.

(105bw) Spectroscopic observations on packed suspensions of *Trichinella spiralis* larvae indicated the presence of the complete classical type cytochrome system to mediate electron transport. R.T.L.

(105bx) When metabolic and purified somatic larval antigens were used for the flocculation test on rabbits with graded infections of from 500 to 400,000 *Trichina* larvae the time interval between the inoculation and the first positive serology varied from one to seven weeks and was inversely related to the size of the infective dose. A greater sensitivity to the reaction was seemingly conferred by the metabolic antigen. R.T.L.

(105by) In trichinella infection produced by *Trichinella spiralis* sterilized by irradiation, the intestinal phase alone stimulated low anti-larval antibody titres if more than one exposure took place. The muscle phase alone, produced by extra-intestinal larval inoculation, stimulated the production of relatively high antibody titres. All the *Trichinella* exposed to 20,000

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105—Journal of Parasitology (cont.)

- †bz. DOUGHERTY, E. C. & HANSEN, E. L., 1956.—“A synthetic basal complement to L medium for axenic cultivation of the nematode *Caenorhabditis briggsae*.” 42 (4, Sect. 2), 17.
- †ca. MORAN, Jr., J. F. & MIZELLE, J. D., 1956.—“Notes on the habitat and tissue-phase of *Ascaridia galli* (Schränk, 1788).” 42 (4, Sect. 2), 18.
- †cb. CHAN, K. F., 1956.—“Methods for securing infective eggs of *Syphacia obvelata* from infected mice.” 42 (4, Sect. 2), 18.
- †cc. TURNER, J. H., 1956.—“Further studies on strongyloidiasis in lambs and kids: development of acquired resistance.” 42 (4, Sect. 2), 18–19.
- †cd. ALLEN, R. W., BECKLUND, W. W. & GILMORE, R. E., 1956.—“Parasites of the Barbary sheep.” 42 (4, Sect. 2), 19.
- †ce. ALICATA, J. E. & KOSHI, J. H., 1956.—“Stability of phenothiazine in cane molasses in control of gastro-intestinal nematodes of cattle.” 42 (4, Sect. 2), 19.

roentgens failed to produce larvae. No larvae were recovered by digestion from rabbits which had been inoculated intramuscularly, but several weeks after rabbits had been inoculated intravenously living larvae and in one instance 27 sexually differentiated adults were found within the muscle.

R.T.

(105bz) For the axenic cultivation of *Caenorhabditis briggsae*, media containing liver or other tissues can be replaced by Gordon's (unpublished) media which has known chemical ingredients. This is a mixture of 18 L-amino acids, D-glucose, ascorbic acid, 13 B-vitamins and related growth factors, “structural compounds” (choline, *D*-inositol, four ribonucleotides plus thymine) and salts of 13 elements (in addition to H, C, N, O, P and S). In this mixture *C. briggsae* slowly grow almost to maturity. When standard liver medium was added, at one-fiftieth the rate usually used, the first generation matured almost as quickly as in liver medium of full strength and growth continued, but more slowly. When the synthetic medium, double strength, was diluted with equal parts of liver medium the growth of first and subsequent generations was stimulated more than in half or full strength liver medium. This was largely due to certain of the salts and vitamins.

R.T.

(105ca) The posterior third of the intestine of chickens is a significant and hitherto unrecognized habitat of *Ascaridia galli*. The larvae rarely penetrate the intestinal mucosa. Infective eggs do not hatch in the crop, proventriculus or gizzard but hatch in the anterior third of the intestine as early as 30 minutes after inoculation. Immature larvae may continue in a “static” condition in the layer of intestinal mucus for considerable periods.

R.T.

(105cb) If experimentally infected mice are autopsied between the 12th and 14th days after infection and the lower colon opened in normal saline the *Syphacia obvelata* migrating from the caecum to the anus will instantaneously shed about 300 eggs each into the fluid. These eggs reach the infective stage, if incubated at 37°C. for three to five hours, and can be stored at 1°C. to 4°C. in normal saline up to 14 days for future use.

R.T.

(105cc) Turner produces further evidence that lambs and kids when appropriately exposed to immunizing infection with *Strongyloides papillosus* rapidly develop resistance to normally lethal infections while susceptible animals which rapidly acquire heavy infection are severely affected.

R.T.

(105cd) At post-mortems on two Barbary sheep, *Ammotragus lervia*, from a herd introduced from North Africa to the open range in New Mexico the helminths collected were *Thysanosoma actinioides*, *Haemonchus placei*, *Pseudostertagia bullosa*, *Cooperia oncophora*, *Nematodirus helvetianus*, *N. spathiger*, *Skrjabinema* sp. (?ovis) and *Trichostrongylus axei*. Although little known in New Mexico the following also occurred: *T. longispicularis*, *T. proboscideus* and *Ostertagia orloffii*.

R.T.

(105ce) Evidence is produced that phenothiazine when mixed with molasses retains its stability and effectiveness for at least two months.

R.T.

†Abstract of paper presented at the 31st Annual Meeting of the American Society of Parasitologists, Storrs, Connecticut, August 26–29, 1956.

05—Journal of Parasitology (cont.)

- †cf. KARTMAN, L., 1956.—“The vector of canine filariasis.” 42 (4, Sect. 2), 19–20.
- †cg. SWARTZWELDER, C., MILLER, J. H., FRYE, W. W. & LAMPERT, R., 1956.—“Evaluation of the efficacy of piperazine adipate for the treatment of patients with trichuriasis.” 42 (4, Sect. 2), 20.
- †ch. YUTUC, L. M., 1956.—“On the unusual hatching posture of the embryo of *Trichuris vulpis* in vitro.” 42 (4, Sect. 2), 20.
- †ci. HUGGHINS, E. J., 1956.—“An ecological study on *Hysteromorpha triloba* (Trematoda: Strigeida) at Oakwood Lakes, South Dakota.” 42 (4, Sect. 2), 26.
- †cj. HUGGHINS, E. J., 1956.—“Further studies on *Hysteromorpha triloba* (Trematoda: Strigeida), and some parasites of a white pelican.” 42 (4, Sect. 2), 26.
- †ck. HSÜ, S. Y. LI & HSÜ, H. F., 1956.—“On the sexual abnormalities in the male *Schistosoma japonicum*.” 42 (4, Sect. 2), 27.
- †cl. WONG, L. & WAGNER, E. D., 1956.—“Studies on reproduction and growth of *Oncomelania nosophora* and *Oncomelania quadrasi*, intermediate hosts of *Schistosoma japonicum*.” 42 (4, Sect. 2), 27.

(105cf) Kartman points out that although the published evidence indicates that both fleas and mosquitoes may act as vectors of *Dirofilaria immitis* the information available leaves much to be desired and is largely speculative. R.T.L.

(105cg) The effectiveness of piperazine adipate on *Trichuris trichiura* was tested on 12 patients, 16 to 71 years old, with egg counts from 100 to 19,300 per ml. Each received 2 gm., as a suspension, in single daily doses for 20 days. There was no significant reduction in the egg counts or any apparent effect on concurrent infections with hookworm or *Strongyloides stercoralis*. R.T.L.

(105ch) During the hatching of *Trichuris vulpis* eggs in vitro the embryo may occasionally leave the shell with the doubled-up middle portion emerging first through one of the poles and the anterior end may be pushed through the other pole. Another unusual method is for the anterior end to emerge at one pole and the posterior end at the other. A third, but rare procedure, is for both ends of the embryo to emerge through one of the poles simultaneously. R.T.L.

(105ci) Huggins has now found the metacercariae of *Hysteromorpha triloba* in *Ameiurus nebulosus* in six lakes in eastern South Dakota. The size of the fish and the number of cysts were directly correlated. Practically all the snails, *Gyraulus hirsutus*, collected after June, liberated the cercariae but none was infected during the winter and spring. R.T.L.

(105cj) A *Pelecanus erythrorhynchos* with fluke and nematode eggs in the faeces was treated with tetrachlorethylene until the fluke eggs had disappeared. The pelican was then fed with black bullheads in which numerous metacercariae of *Hysteromorpha triloba* were encysted. At autopsy the only parasites found were *Bolbophorus confusus*, *Oligorchis longipaginosus* and *Contracaecum spinigerum*. Apparently the tetrachlorethylene had only temporarily inhibited the production of the fluke eggs while the nematode eggs continued to be passed in the faeces in large numbers throughout the treatment. R.T.L.

(105ck) The number and arrangement of the testes and the occurrence of hermaphroditic abnormalities were observed in *Schistosoma japonicum* males recovered from hosts infected with male and female cercariae and from hosts which had been infected with male cercariae. [But no details are given.] R.T.L.

(105cl) Wong & Wagner have reared *Oncomelania nosophora* and *O. quadrasi* in saucers and petri dishes. The number of eggs laid per day by *O. nosophora* was 0.2 and by *O. quadrasi* 0.7. The growth rates were approximately the same in the two species but levelled off at about 16 weeks in *O. nosophora* and 12 weeks in *O. quadrasi*. *O. nosophora* produced an average of 80 young in a 4-month period and *O. quadrasi* an average of 127.5 in a 6½-month period. Snails with less than 2½ whorls failed to survive desiccation for 30 minutes. Those with 3 to 3½ whorls survived better but were killed by drying for 15 hours. R.T.L.

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105—Journal of Parasitology (cont.)

- †cm. SINDERMANN, C. J., 1956.—"The ecology of marine dermatitis-producing schistosomes. I. Seasonal variation in infection of mud snails (*Nassa obsoleta*) with larvae of *Austroilharzia variglandis*." 42 (4, Sect. 2), 27.
- †cn. GOODCHILD, C. G., 1956.—"Transfaunation of *Schistosomium douthitti*." 42 (4, Sect. 2), 27-28.
- †co. DUNN, M. C. & BYRD, E. E., 1956.—"Developmental stages in the Digenea. IV. The miracidium of *Neorenifer wardi* (Byrd, 1936) and *Dasymetra conferta* Nicoll, 1911." 42 (4, Sect. 2), 28.
- †cp. MACY, R. W., 1956.—"The life cycle of *Plagiorchis parorchis*, n.sp., (Trematoda: Plagiorchiidae)." 42 (4, Sect. 2), 28.
- †cq. JORDAN, H. E. & BYRD, E. E., 1956.—"Observations on the genus *Atrophecoecum* Bhalerao, 1940." 42 (4, Sect. 2), 28-29.
- †cr. BULLOCK, W. L., 1956.—"The comparative histochemistry of alkaline glycerophosphatases in the Acanthocephala." 42 (4, Sect. 2), 29.

(105cm) The incidence of marine schistosome dermatitis in northern New England is dependent on the seasonal migration and infection percentages of the molluscan vector *Nassa obsoleta*. With the death of molluscs in late winter these sources of infection disappear, to be replaced by new infections acquired by molluscs in the preceding autumn. In September and October there is a normal off-shore movement of the snails from the high tide zone to winter aggregation sites near or below the mean tide line. Those remaining behind have a high incidence of larval infection which forms a source of infection of the avian hosts during their autumn migration. Those infected snails which have migrated to in-shore areas are reduced in number by their exposure to sub-freezing temperatures, icing of the tidal flats and other winter environmental changes. The incidence of infection in snails living at or below mean low tide is low throughout the year.

R.T.L.

(105cn) *Schistosomium douthitti*, removed from white mice 4 to 42 days after infection and transplanted into the anterior chamber of the eye of white rats, mated and produced eggs containing miracidia. The rate of growth was apparently depressed, as 20-day-old worms, 1.9 mm. long when taken from the veins are only 1.2 mm. after 20 further days in the eye, while 40-day-old worms taken from the veins average about 2.3 mm. in length.

R.T.L.

(105co) With *intra vitam* stains the miracidium of *Neorenifer wardi* contains 8 to 10 large deeply staining nuclei while that of *Dasymetra conferta* always contains 8 such nuclei. In both species there are always two quite large nuclei, each surrounded by a much larger mass of cytoplasm, and several smaller nuclei in a much less conspicuous mass. In preparations fixed in Gibson's or Schaudinn's fluid and stained with iron haematoxylin up to 16 large nuclei were counted in *N. wardi* miracidia and only 8 in *D. conferta*. These nuclei probably belonged to the germinal line. None was observable in the somatic cells.

R.T.L.

(105cp) A xiphidiocercaria belonging to Sewell's *polyadena* group was present in large numbers, in irregularly shaped sporocysts, in numerous *Limnaea stagnalis* in Cascadia Lake, Orcas Island, Washington D.C. The cercariae encyst in caddis-fly and mosquito larvae and become adult when these are fed to mice. As the adult worm has the testes more nearly opposite each other than in *Plagiorchis micracanthos* it is named *P. parorchis* n.sp.

R.T.L.

(105cq) A trematode closely related to *Atrophecoecum diploporus* [but not yet named] was found in an *Alligator mississippiensis* from South Central Georgia.

R.T.L.

(105cr) In adult Acanthocephala the prime site of alkaline glycerophosphatase activity is in the outer layer of the subcuticula and is probably concerned in the absorption of food-stuffs. There is little or none in the middle layer, while the inner radial fibre layer is somewhat less active than the outer layer. Larval forms were generally negative.

R.T.L.

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105—Journal of Parasitology (cont.)

- †cs. LAURIE, J. S., 1956.—“The *in vitro* fermentation of carbohydrates by two species of tapeworms and one species of *Acanthocephala*.” 42 (4, Sect. 2), 29.
- †ct. SUGIURA, S., 1956.—“On treatment of schistosomiasis japonicum by means of Triostam (sodium antimonyl gluconate).” 42 (4, Sect. 2), 30.
- †cu. BERRY, J. E. & MIZELLE, J. D., 1956.—“Composition of the haptoral armament and copulatory complex of *Urocleidus ferox* Mueller, 1934.” 42 (4, Sect. 2), 30.
- †cv. OGREN, R. E., 1956.—“Embryonic development and morphology of onchospheres of the tapeworm *Ochioristica symmetrica* (Cyclophyllidae: Linstowidae).” 42 (4, Sect. 2), 30–31.
- †cw. VOGEL, M. & TURNER, J. A., 1956.—“The effect of different temperatures on the development of *Hymenolepis diminuta* (Cestoda: Cyclophyllidae) in *Tribolium confusum*.” 42 (4, Sect. 2), 31.
- †cx. HEYNEMAN, D. & WELSH, J. F., 1956.—“*In vitro* study of *Hymenolepis nana* rabbit antiserum against eggs, cysticercoids, and adult stages of that parasite.” 42 (4, Sect. 2), 31.
- †cy. READ, C. P. & ROTHMAN, A. H., 1956.—“Carbohydrate quantity and quality: its significance in the biology of tapeworms.” 42 (4, Sect. 2), 31.
- †cz. McNEIL, C. W. & WALTER, W. M., 1956.—“Surface-wintering of aquatic snails in central Washington.” 42 (4, Sect. 2), 33.
- †da. PAN, C., 1956.—“Studies on the biological control of schistosome-bearing snails: a preliminary report on pathogenic microorganisms found in *Australorbis glabratus*.” 42 (4, Sect. 2), 33.
- †db. DOSS, M. A., 1956.—“The role of documentation in parasitological research.” 42 (4, Sect. 2), 34.

(105cs) Laurie gives a preliminary report of his *in vitro* experiments on the fermentation of glucose, galactose, mannose, fructose and maltose by *Ochioristica symmetrica*, *Moniliformis dubius* and *Hymenolepis diminuta*, and on the inhibitory effects of quinacrine, chloroquine diphosphate, thorazine and acriflavine. R.T.L.

(105ct) Twelve injections of sodium antimonyl gluconate cured [unspecified] animals having mature *Schistosoma japonicum* infections and others exposed to cercariae before commencement of treatment. Three adults and 50 children treated every other day for a total of 12 injections each of 3–3.5 mg. per kg. body-weight and 10 individuals who received 6, 8, 9 and 12 daily injections at the rate of 3–5 mg. per kg. had ceased to discharge eggs within three months, but one adult injected six times, once every other day, remained positive. R.T.L.

(105cu) The accessory piece, bars, interior of the hooks and the base of the anchors of *Urocleidus ferox* reacted positively with Millon's reagent for proteins containing tyrosine, while the anchor shafts and points reacted positively in Berg's ninhydrin for free alpha amino-acids of proteins. The reactions of the cirrus were negative. R.T.L.

(105cw) When beetles were infected with *Hymenolepis diminuta* and kept at 15°C. cysticercoids took 65 days, but at 37°C. only 5 days, to mature. At 40°C. only abnormalities appeared. R.T.L.

(105cz) *Stagnicola palustris nuttalliana* and *Fossaria perplexa*, collected from canal banks between March and May, had well-formed epiphragms and apparently had survived the winter without burrowing. Between October and April 32°F. was the maximum and -17°F. the minimum temperature recorded locally by the Moses Lake Weather Bureau Station. R.T.L.

(105da) Efforts are in progress to culture two micro-organisms, one an acid-fast bacillus-like rod the other a fungus spore- or yeast-like agent, which cause pathological changes in *Australorbis glabratus*. R.T.L.

†Abstract of paper presented at the 31st Annual Meeting of the American Society of Parasitologists, Storrs, Connecticut, August 26–29, 1956.

105—Journal of Parasitology (cont.)

- †dc. SWEATMAN, G. K., 1956.—“Acquired immunity in lambs infected with *Taenia hydatigena* Pallas, 1766.” **42** (4, Sect. 2), 34.
- †dd. HEDRICK, R. M., 1956.—“The distribution of succinic dehydrogenase activity in *Hymenolepis diminuta* and *Raillietina cesticillus*.” **42** (4, Sect. 2), 34.
- †de. WARD, J. W. & BRADSHAW, R. C., 1956.—“New records of the occurrence of the hydatid tapeworm, *Echinococcus granulosus*, in central and south Mississippi.” **42** (4, Sect. 2), 35.
- †df. READ, C. P. & ROTHMAN, A. H., 1956.—“Polysaccharide metabolism in cestodes and *Acanthocephala*.” **42** (4, Sect. 2), 35.
- †dg. DAUGHERTY, J. W., 1956.—“The active absorption of methionine by cestodes.” **42** (4, Sect. 2), 35.
- †dh. CROSS, Jr., J. H. & SCOTT, J. A., 1956.—“Some stages in the life cycle of *Nematospiriodendubius* Baylis, 1926 (Nematoda: Heligmosomidae).” **42** (4, Sect. 2), 36.
- †di. FISCHTHAL, J. H., 1956.—“A new digenetic trematode from the muskellunge, *Esox masquinongy*.” **42** (4, Sect. 2), 37.
- †dj. ETGES, F. J. & PATZER, M. E., 1956.—“Studies on the genus *Plagitura* Holl, 1928 (Trematoda: Plagiorchidae).” **42** (4, Sect. 2), 37.
- †dk. LEVINE, N. D., BEAMER, P. D. & MAKSIĆ, D., 1956.—“Hepatitis due to *Amphimerus pseudofelineus* in a cat.” **42** (4, Sect. 2), 37.

(105dc) Lambs, three months old, which had received an initial dose of 50 to 800 *Taenia hydatigena* eggs were given a challenging dose of 5,000 eggs seven weeks later. When examined three weeks later the liver of all the lambs showed similar repaired hepatic lesions and cysticerci containing fully developed rostellar hooks, in the omentum and mesentery; the latter being attributable to the initial dose. In the control lambs, which had received only the dose of 5,000 eggs, there were recent haemorrhagic streaks throughout the liver, open pits in Glisson's capsule and in the abdominal fluid and elsewhere small cysticerci which were recognized from previous study as those which occur three weeks after infection. R.T.L.

(105dd) The distribution of succinic dehydrogenase activity in *Raillietina cesticillus* and in *Hymenolepis diminuta* is similar. Some details are given of its concentrations in the various tissues. R.T.L.

(105de) The unilocular type of hydatid was present in 4.03% of the livers of 8,066 hogs, mostly under two years old, from south and central Mississippi. In other records made available from the same area, slightly over 1% of 800 cattle had unilocular cysts. No hydatid cysts were recovered from 1,157 animals shipped from St. Louis, Missouri. R.T.L.

(105df) Read & Rothman have studied glycogen metabolism in *Hymenolepis diminuta*, *H. citelli* and *Moniliformis dubius* and have obtained similar results in all three. Figures are given for glycogenesis and glucose utilization in *H. diminuta*, together with details of the host strain and technique used as both may greatly affect quantitative results. S.W.

(105di) A new trematode found in *Esox m. masquinongy* from Lake Teal, Wisconsin is stated to belong to a new genus and species of uncertain family relationship [not yet described or named]. R.T.L.

(105dj) Mature specimens similar to *Plagitura parva* but three to four times larger than the maximum size hitherto reported and immature specimens containing few or no eggs but larger than fully mature and gravid adults of *P. parva* and *P. salamandra*, were found in several *Triturus viridescens* from Bear Lake, Scioto County, Ohio. R.T.L.

(105dk) Distended bile-ducts, containing many *Amphimerus pseudofelineus*, peripheral cirrhosis, proliferation of the bile-duct, with centrolobular fatty changes and chronic passive congestion of the liver were found in an Illinois cat. Before death it had had symptoms of inco-ordination, blindness and hepatitis. R.T.L.

†Abstract of paper presented at the 31st Annual Meeting of the American Society of Parasitologists, Storrs, Connecticut, August 26–29, 1956.

105—Journal of Parasitology (cont.)

- †dl. PENNER, L. R. & WAGNER, A., 1956.—“Concerning the early developmental stages of *Ornithobilharzia canaliculata* (Rudolphi, 1819).” 42 (4, Sect. 2), 37–38.
- †dm. PENNER, L. R., 1956.—“Studies on the biology of marine acquired avian schistosomiasis.” 42 (4, Sect. 2), 38.
- †dn. LEIGH, W. H., 1956.—“The life-history of *Macroderoides spiniferus* Pearse, 1924, a trematode of the Florida spotted gar, *Lepisosteus platyrhincus*.” 42 (4, Sect. 2), 38.
- †do. LEIGH, W. H., 1956.—“Observations on life-histories of members of the genus *Ascocotyle* Looss (Heterophyidae).” 42 (4, Sect. 2), 39.
- †dp. ULMER, M. J., 1956.—“Development of *Cotylurus flabelliformis* tetracotyles in the second intermediate host (Trematoda: Strigeidae).” 42 (4, Sect. 2), 39.
- †dq. THOMAS, L. J. & TAKOS, M. J., 1956.—“The pathology and pathogenesis of fatal infections due to an acanthocephalid parasite of marmoset monkeys.” 42 (4, Sect. 2), 39–40.

(105dl) The eggs of *Ornithobilharzia canaliculata*, with bloody exudate in severe cases, appear in the faeces of pigeons in about a month after exposure to infection. The miracidium usually has 22 dermal cells in 4 tiers, of 6, 9, 4, and 3. Relatively short branched daughter sporocysts containing cercariae occurred in naturally infected *Batillaria minima*. The larval stages seem to relate *O. canaliculata* to the genus *Austrobilharzia*. R.T.L.

(105dm) The incidence of *Ornithobilharzia canaliculata* infections in its marine snail host *Batillaria minima* exhibits two seasonal peaks which are partly regulated by the age of the snails and by the visitations of its definitive hosts (the Royal, Caspian and other large terns) to the sandy spits of land along the Gulf Coast of Florida. The histopathology of avian schistosomiasis is very similar to that of mammalian schistosomiasis. R.T.L.

(105dn) *Macroderoides spiniferus* develops in *Helisoma duryi* in sporocysts which produce xiphidiocercariae. These penetrate into and encyst in the muscles of *Gambusia affinis holbrooki* and several other small fishes. After approximately 14 days the metacercaria becomes infective to its definitive host *Lepisosteus platyrhincus* in which it reaches sexual maturity in 12 days. R.T.L.

(105do) Metacercariae of three species of *Ascocotyle* occur in small fishes in South Florida and have been reared to sexual maturity in chicks. That found in thick-walled cysts in the mesenteries and viscera of *Gambusia affinis holbrooki* and *Molliensia latipinna* proved to be *Ascocotyle mcintoshi* described by Price from *Guara alba*. A thin-walled metacercaria from the conus arteriosus of *M. latipinna* was reared in chicks, but is not yet described or named. A third metacercaria, principally found in *Gambusia* but occasionally in *Molliensia* and *Chaenobryttus coronarius*, when developed in chicks was identified as *A. tenuicollis* which was found to occur locally in *Florida c. caerulea* and *Hydranassa tricolor ruficollis*. R.T.L.

(105dp) The development of the metacercaria of *Cotylurus flabelliformis* in *Limnaea reflexa* is described in detail. In experimental infections there are fully formed encysted tetracotyles in 20 to 30 days. R.T.L.

(105dq) Four *Saimiri o. oerstedii*, from Panama, died suddenly from a naturally acquired infection with *Prosthenorchis elegans*; three of the monkeys had perforations of the colon with secondary acute peritonitis. The perforations occurred through the serous nodules where the acanthocephalans were attached. Bacteriological examination from the peritonitis and from the heart blood revealed a bacillus resembling *Escherichia coli*. As the parasites had made a great number of tunnels in the bowel wall and there were only a few areas of acute bacterial infection, it is suggested that these parasites secrete some substance which usually prevents the establishment of the bacteria in the tunnels. R.T.L.

†Abstract of paper presented at the 31st Annual Meeting of the American Society of Parasitologists, Storrs, Connecticut, August 26–29, 1956.

105—Journal of Parasitology (cont.)

- †dr. WILSON, G. I., 1956.—“Some parasites of the English sparrow in Maryland.” 42 (4, Sect. 2), 40.
- †ds. THOMAS, L. J. & BABERO, B. B., 1956.—“Studies on rodent echinococcosis.” 42 (4, Sect. 2), 40.
- †dt. HWANG, J. C. & KATES, K. C., 1956.—“Morphological variations in the embryonic hooks of tapeworms.” 42 (4, Sect. 2), 41.
- †du. DOUGLAS, L. T., 1956.—“The early embryology of the nematotaeniid cestode, *Baerietta diana* (Helfer, 1948) comb. nov.” 42 (4, Sect. 2), 41.
- †dv. MCINTOSH, A., 1956.—“Early stages of the larvae (*Cysticercus bovis*) of *Taenia saginata*.” 42 (4, Sect. 2), 41.
- †dw. KRUIDENIER, F. J. & GALLICCHIO, V., 1956.—“A survey of cestodes in mammals from Grand Canyon National Park.” 42 (4, Sect. 2), 42.

(105dr) The *Capillaria* sp. and *Microtetrameres* sp. in English sparrows collected in Maryland are new host and locality records. *Choanotaenia passerina* was present in two of the birds autopsied.

R.T.L.

(105ds) Echinococcosis on St. Lawrence Island is maintained by voles, dogs and foxes which reach the island by ice floes or bridges. There is evidence that this alveolar type of the disease is already established on the North American mainland. The rate of cystic development in laboratory mice is much slower than in field-mice and ground squirrels. Eggs stored at 2°C. in water for over two years were infective to voles. Very old dehydrated fox scats from the tundra contained eggs which were viable even after storage for two years.

R.T.L.

(105dt) The embryonic hooks of oncospheres in some species are identical. In others there are two or three morphological types. Their length varies from 7μ to 25μ or more; some are robust, others are slender; some have guards varying considerably in appearance while in others they are absent. The handle of the hook may have a terminal knob-like enlargement or this may be absent.

R.T.L.

(105du) After the entry of the sperm nucleus into the oocyte, prophase chromosomes quickly appear followed by maturation divisions. The polocytes are normally formed at the junction of the oocyte and its attached yolk cell. Cleavage is alternate, unequal and irregular until the six-cell embryo formed of two macromeres, two micromeres and two mesomeres, together with attached polar bodies and yolk cell. There are three embryonic membranes. One arises from uterine cells the others from specialized blastomeres. [The appearance of *Baerietta diana* (Helfer, 1948) n.comb. in the title is not explained in the text.]

R.T.L.

(105dv) Bovines slaughtered at the end of the first week after experimental infection with the eggs of *Taenia saginata* showed no evidence of cysticerci. After 11 days there were nodules, 2 to 3 mm. in size, containing cysticerci 0.15–0.13 mm. \times 0.13–0.09 mm. At the end of the second week cysts 3 \times 4 mm. contained thin ovate cysticerci 0.16–0.17 mm. \times 0.1–0.13 mm. At the end of the third week a cyst 6 \times 7 mm. from the heart contained a balloon-shaped cysticercus 1.3 \times 0.875 mm. A cyst 8 \times 9 mm. from the diaphragm enclosed a bladder-like cysticercus 1.65 \times 1.38 mm. and one 10 \times 7 mm. from the masseter showed a cysticercus 1.3 \times 0.9 mm. At the end of the fourth week cysts from the masseter contained cysticerci 0.95 \times 0.95 to 1.15 \times 0.82 mm. in size. These showed invagination and the commencement of scolex formation, but no evidence of suckers.

R.T.L.

(105dw) Kruidenier & Gallicchio give, at present, the cestode families only of the tapeworms found in 14 of the 43 species of mammals autopsied during their collecting expedition to the Grand Canyon National Park, Arizona.

R.T.L.

†Abstract of paper presented at the 31st Annual Meeting of the American Society of Parasitologists, Storrs, Connecticut, August 26–29, 1956.

106—Journal of Pediatrics.

- a. EWING, G. M. & TILDEN, I. L., 1956.—“*Capillaria hepatica*. Report of fourth case of true human infestation.” 48 (3), 341–348.
- b. SADUN, E. H. & MELVIN, D. M., 1956.—“The probability of detecting infections with *Enterobius vermicularis* by successive examinations.” 48 (4), 438–441.

(106a) The fourth genuine case of human infection with *Capillaria hepatica* to be recorded is reported in a Caucasian child, 15 months old, in Hawaii. At autopsy innumerable larva and degenerated adults of *C. hepatica* were found in microscopical sections of the liver. Calcified fragments in the lungs and kidneys probably represented degenerated parasites.

R.T.L.

(106b) Evidence is cited that a single examination for *Enterobius vermicularis* by the cellulose tape method reveals only a fraction of the existing infection and that six consecutive examinations may be necessary to obtain high and constant proportion of the infections existing in a population groups with different rates of prevalence.

R.T.L.

107—Journal of Pharmacy and Pharmacology. London.

- a. QAZILBASH, N. A., 1956.—“A further note on the gravimetric determination of santonin.” 8 (1), 27–32.

108—Journal of the Royal Army Medical Corps.

- a. TRAPNELL, D. H., 1956.—“Eosinophilia in East African and Mauritian troops. An analysis of 150 cases.” 102 (1), 73–76.

109—Journal of Tropical Medicine and Hygiene.

- a. CONRAN, O. F. & WADDY, B. B., 1956.—“Effect of antrypol treatment on blindness due to onchocerciasis.” 59 (3), 52–57.

(109a) Given intravenously in doses of 1 gm. weekly for five weeks antrypol can restore the sight of many cases of blindness due to onchocerciasis. It can be administered to large numbers in remote villages and in the bush. Although not uncommon allergic phenomena are mild. The paper includes 10 case reports.

R.T.L.

110—Journal of the West African Science Association.

- a. EDWARDS, E. E., 1956.—“Human onchocerciasis in West Africa with special reference to the Gold Coast.” 2 (1), 1–35.

(110a) Edwards summarizes the history, geographical distribution and pathological manifestations of onchocerciasis in Africa, the life-cycle and mode of transmission of *Onchocerca volvulus*, and describes the egg, larva, pupa and adult of *Simulium damnosum*, its principal vector in West Africa. The *Simulium* species recorded for the Gold Coast are listed with their localities. *S. damnosum* probably survives in the egg stage during the dry season which may extend over several months in the Northern Territories of the Gold Coast. Control measures based on the application of insecticides to the rivers require further research. Edwards recommends the addition to D.D.T. of clay of high colloidal quality in the proportion of one part D.D.T. 10% in kerosene, 10 parts of soap and 100 parts of clay heated together for three hours at 85° to 95°C. When applied at the rate of 0.03 parts of commercial D.D.T. per million of river water for 23 minutes all the *Simulium* larvae were destroyed for a distance of 24 miles without killing the fish. Manually operated machines producing exhaust-atomized D.D.T. in oil have given promising results against the adult flies on the Gold Coast.

R.T.L.

111—Mededelingen. Directeur van de Tuinbouw. 's- Gravenhage.

- a. OOSTENBRINK, M., 1956.—“Nematoden. De stand van het onderzoek en de bestrijding.” 19 (2), 92–99. [English summary p. 99.]

(111a) In this brief survey of the importance of nematodes in horticulture the groups dealt with are *Aphelenchoides* spp., *Ditylenchus* sp., *Meloidogyne* spp., *Heterodera* spp., *Paratylenchus* spp., *Pratylenchus* spp., *Hoplolaimus uniformis* and *Tylenchorhynchus* spp. Control measures are discussed in general terms.

M.T.F.

112—Medycyna Doświadczalna i Mikrobiologia. Warsaw.

- a. JEZIORAŃSKA, A., 1956.—“Odczyny alergiczne w włośnicy u zwierząt doświadczalnych.” 8 (1), 89–102. [English & Russian summaries pp. 101–102.]

(112a) Freed *Trichinella spiralis* larvae were given to white rabbits and white guinea-pigs, and white rats were fed with meat containing a large number of *Trichina* cysts. Intradermal tests with *Trichinella* antigens in concentrations of 1:5,000 and 1:10,000 were made on the rabbits 3 to 229 days after infection, on the guinea-pigs on the 8th and 26th day after infection and on the white rats in the period between the 9th and the 101st day after infection. Three antigens were used. In the rabbit the first positive results appeared about 10 days after infection. About 66% to 76% gave positive results with one of the antigens and developed trichinosis. When the second antigen was used about 49% to 54% gave positive results. The other antigen was inactive. The allergic reactions in the guinea-pigs were poor and were negative in the white rats.

R.T.L.

113—Mitteilungen der Deutschen Landwirtschafts-Gesellschaft.

- a. SCHEIBE, K., 1956.—“Zur Nematodengefahr im Kartoffelbau.” 71 (1), 4–6.
b. GOFFART, H., 1956.—“Der Einfluss von Nematodenkrankheiten auf Anbau und Ertrag von Feldfrüchten.” 71 (3), 55–57.

(113a) In this general account of the damage caused by the potato-root eelworm, *Heterodera rostochiensis*, the author describes the symptoms, the life-history of the parasite, the method of soil sampling used to establish its presence, and its occurrence in Germany. The only practicable method of control is by crop rotation, for which recommendations are made.

M.T.F.

(113b) Goffart discusses the nematode diseases of sugar-beet, potatoes and cereals, giving particular attention to control by crop rotation. Sugar-beet eelworm is increased by the cultivation of cruciferous crops; good crops to grow before beet are legumes and cereals. In the presence of potato-root eelworm recommended crops are beet, oats and clover. Cereal root eelworm does most damage to oats. The varieties Adlerhafer, Heines Silber and Lohmanns Weender IV are resistant. Potatoes, beet, cabbage, peas and clover are suitable crops for the rotation.

M.T.F.

114—Mitteilungen Serie B. Obst und Garten. Klosterneuburg.

- a. SCHINDLER, H., 1956.—“Beitrag zur Nematoden-Bekämpfung bei Sellerie.” 6 (1), 1–6. [English summary p. 6.]

(114a) Celery is often attacked by nematodes in Viennese vegetable gardens. The plants cease growth and in dry summers the leaves turn yellow and then red. The plants remain small and the attacked roots may die. Plots were laid out on infested land and five treatments were carried out in duplicate: (i) steaming, (ii) parathion, (iii) D-D mixture, (iv) chloropicrin

and (v) control. Good growth and highest yields resulted from steaming and chloropicrin, next was D-D followed by parathion. Steam and chloropicrin are too expensive for use in the field, D-D is effective and economical but rather phytotoxic and parathion has only a temporary effect. The most practical measures of control are by crop rotation, fallowing, soil cultivations and the growth of enemy or trap-crops to hinder increase of the nematodes.

M.T.F.

115—*Nachrichtenblatt des Deutschen Pflanzenschutzdienstes. Stuttgart.*

- a. WEISCHER, B., 1956.—“Nematoden an Baumschulgewächsen.” 8 (3), 34–36.

(115a) After a general introduction on the relationships of ectoparasitic nematodes and roots, mention is made of the presence of species of *Rotylenchus*, *Tylenchorhynchus* and *Ditylenchus* around the roots of *Picea sitchensis*. The effect of soil fumigation with chloropicrin on the root systems of *P. omorika* is illustrated as is also nematode damage to pine roots. Associated with pine roots were *Pratylenchus penetrans*, *Tylenchorhynchus dubius*, *Rotylenchus robustus*, *Psilenchus hilarulus* and *Longidorus elongatus*. Associated with roots of deciduous trees were *Pratylenchus penetrans*, *P. pratensis*, *Ditylenchus intermedius*, *Tylenchorhynchus dubius* and *Rotylenchus robustus*.

J.B.G.

116—*Nature. London.*

- a. MORETON, B. D., JOHN, M. E. & GOODEY, J. B., 1956.—“*Aphelenchoides* sp. destroying mushroom mycelium.” [Correspondence.] 177 (4513), 795.
 b. CAPSTICK, C. K., 1956.—“Lactophenol preparations for soil nematodes.” [Correspondence.] 177 (4515), 896–897.
 c. COETZEE, V., 1956.—“*Meloidogyne acronea*, a new species of root-knot nematode.” [Correspondence.] 177 (4515), 899–900.
 d. BHATIA, M. L., 1956.—“Extraocular photoreceptors in the land leech *Haemadipsa zeylanica agilis* (Moore) from Nainital, Almora (India).” [Correspondence.] 178 (4530), 420.

(116a) Six weeks after sterile compost had been spawned with mushroom mycelium and inoculated with 15 specimens of *Aphelenchoides* sp. the mycelium had largely disappeared while the eelworms had increased to approximately three millions. In a similar pot experiment with 15 specimens of *Panagrolaimus* sp. the eelworm had only increased to 72,000 and the mycelium was as undamaged as in the control.

R.T.L.

(116b) When making lactophenol mounts of nematodes the coverslip may be supported by short lengths of 80/20 nickel-chromium resistance wire instead of glass fibres. The wire is made in standard diameters of 25 μ , 30 μ , 40 μ and 50 μ to a tolerance of $\pm 2.6 \mu$. With supports of a known constant diameter the required amount of lactophenol to fill exactly the space under the coverslip can be calculated and delivered by means of a micropipette fitted with a “Pumpett” attachment, thus simplifying the mounting process.

M.T.F.

(116c) Coetzee describes *Meloidogyne acronea* n.sp. first found on the roots of *Sorghum vulgare* in Cape Province and transferred to beans and tomatoes. Measurements are given of adult males and females and of larvae and eggs. This species differs from the others in that the posterior part of the female is drawn out into a rounded protuberance on which are the vulva and anus. The perineal pattern is extremely obscure and the cuticle is tougher. The female produces about 1,000 eggs laid in a gelatinous matrix but does not always remain embedded in the root and the egg sac is often lost in the soil. The stylet is slightly more robust and the head framework less heavily sclerotized than in the other species. The tip of the larval tail is more rounded. The phasmids in the male are post-anal. There are no cross-striations on the lips of larva or male.

M.T.F.

117—Nematologica.

- a. BRANDE, J. VAN DEN, KIPS, R. H. & D'HERDE, J., 1956.—“Survey of the results of four years experiments on the chemical control of the potato root eelworm.” 1 (2), 81–86. [Discussion pp. 86–87.]
- b. WILLIAMS, T. D., 1956.—“The resistance of potatoes to root eelworm.” 1 (2), 88–91. [Discussion pp. 91–93.]
- c. HUIJSMAN, C. A., 1956.—“Breeding for resistance to the potato root eelworm in the Netherlands.” 1 (2), 94–99.
- d. TOXOPEUS, H. J., 1956.—“Some remarks on the development of new biotypes in *Heterodera rostochiensis* that might attack resistant potato-clones.” 1 (2), 100–101.
- e. BINGEFORS, S., 1956.—“Inheritance of resistance to stem nematodes in red clover.” 1 (2), 102–108. [Discussion p. 108.]
- f. JONES, F. G. W., 1956.—“Soil population studies using microplots.” 1 (2), 109–110. [Discussion p. 110.]
- g. ELLENBY, C., 1956.—“A source of the variation of hatching data for the potato root eelworm, *Heterodera rostochiensis* Wollenweber.” [Abstract.] 1 (2), 111. [Discussion p. 111.]
- h. LAAN, P. A. VAN DER, 1956.—“The influence of organic manuring on the development of the potato root eelworm, *Heterodera rostochiensis*.” 1 (2), 112–124. [Discussion pp. 124–125.]
- i. JANZEN, G. J. & TUIN, F. VAN DER, 1956.—“The unknown hatching agent for the potato root-eelworm. (Some purification aspects.)” 1 (2), 126–136. [Discussion pp. 136–137.]
- j. OUDEN, H. DEN, 1956.—“The influence of hosts and non-susceptible hatching plants on populations of *Heterodera schachtii*.” 1 (2), 138–144. [Discussion p. 144.]
- k. WALLACE, H. R., 1956.—“The effect of soil structure on the emergence of larvae from cysts of the beet eelworm.” 1 (2), 145–146.
- l. GORLENKO, M. V., 1956.—“Predatory fungi and their utilisation in nematode control.” 1 (2), 147–150.
- m. SVESHNIKOVA, N. M., 1956.—“A review of the study of nematodes in the families Heteroderidae and Tylenchidae, causing crop diseases in the U.S.S.R.” 1 (2), 151–158. [Discussion p. 158.]
- n. SEINHORST, J. W., 1956.—“Population studies on stem eelworms (*Ditylenchus dipsaci*).” 1 (2), 159–164.
- o. HAUT, H. VAN, 1956.—“Das Champignon-Myzel als Indikator für die Wirkung saprober Nematoden in Komposten.” 1 (2), 165–173. [Discussion p. 173.]

(117a) During experiments with nematicides against *Heterodera rostochiensis* it was found that moisture had a marked influence on cyst-chemical reaction. At 23°C. dry cysts exposed to D-D vapour for one month still contained hatchable larvae: if the cysts were wetted before treatment, exposure for 20 minutes resulted in 100% kill. Chlorobromopropene killed dry cysts in five days but in less than five minutes if the cysts were wet. Other chemicals gave corresponding results. In sandy soil 4l. per are of D-D had no effect on cysts when the soil was dry (0.7%) but at 4.2% moisture content 100% kill occurred except in the top inch. At 11.8% moisture and 8l. per are there was 100% kill at all points. In saturated soil only the cysts close to the injection point were affected. Low temperatures appeared to have little effect on kill. Distribution of fumigants in the soil was rapid and only little affected by moisture content. It is concluded that the moisture content of the soil at the time of treatment will determine its effectiveness both because of its influence on distribution of the fumigant and also on the vulnerability of the cysts to chemical action. Soaking of cysts after D-D treatment reduced its lethal action. The importance of humidity has been helpful in working out a treatment for killing nematode cysts attached to tubers of begonia and gloxinia without damage to the plants. An efficient treatment is chlorobromopropene at 0.05% and 0.025%. [1 hectare=100 ares.]

M.T.F.

(117b) Eelworm resistance in potatoes may be due to several factors. The influence of the “hatching factor” in potato root diffusate was investigated by exposing cysts to potato root leachings. Diffusates from a range of resistant plants were studied and it was found that most of the resistant plants produced strongly active diffusates. The resistant properties of *Solanum andigenum* are not due to a failure to produce active diffusate. In this respect it was noted that *S. vernei* did possess a relatively less active diffusate. All the plants were invaded by larvae in varying degrees but few mature or developing females were seen in the resistant plants.

H.R.W.

(117c) Numerous seedlings were tested for resistance, the material being derived from intercrosses of resistant *Solanum andigenum* seedlings as well as from crosses between resistant *andigenum* seedlings and susceptible *tuberosum* varieties. The absence of cysts on the roots was the criterion of resistance. There is a clearly defined difference between resistant and susceptible seedlings. Resistance appears to be due to a single dominant gene. This monogenic dominance is complicated by the fact that *S. andigenum* and *S. tuberosum* show tetraploid segregations. The introduction of resistant genes is relatively simple but combining resistance with other desirable features is difficult. Larvae of the potato-root eelworm penetrate both resistant and susceptible plants in the same numbers but further development within the resistant plant is inhibited. There is no indication of the occurrence of physiological races of eelworm. H.R.W.

(117d) Toxopeus points out the possibility that new biotypes of *Heterodera rostochiensis* may arise which are able to develop on potatoes resistant to the common type. He discusses the conditions necessary for the success of such a biotype, pointing out the difficulties of assessing its chances of success. He considers that it is important to continue the search for resistant potatoes so that a different genetic background will be available as a safeguard in case the one at present being developed becomes susceptible to some new biotype. M.T.F.

(117e) Bingefors briefly mentions work on the inheritance of resistance to nematode attack in various plants and then proceeds to detail his own work. Selection of resistant plants from susceptible Ultuna red clover growing in stem nematode infested ground yielded plants (U 056), after two years, with greatly improved resistance. The study of inheritance is still proceeding although an interim report is given of the analysis of various crosses to date between susceptible Ultuna and resistant Merkur red clover. As yet the mechanism of the inheritance of resistance is not elucidated. J.B.G.

(117f) [The full account of this work appears in *Ann. appl. Biol.*, **44**, 25-56. For abstract see No. 56c above.]

(117g) [The full account of this work appears in *Ann. appl. Biol.*, **44**, 1-15. For abstract see No. 56a above.]

(117h) Studying the effects of farm-yard manure and compost on the infestation of potatoes by *Heterodera rostochiensis*, van der Laan found in preliminary pot experiments that the infestation was appreciably less in pots containing farm-yard manure than in those with artificial fertilizer or no manure. In another experiment treatments were with (i) artificial fertilizer, (ii) farm-yard manure, (iii) compost plus artificials, (iv) no additions. In (ii) and (iii) development of the larvae in the roots was hampered, but many reached maturity. Number of cysts per gm. of root was lowest in these treatments but total number of cysts produced was largest in the compost series due to the strong root growth. Fewest cysts were produced in the farm-yard manure and control series. The author considers that retardation of development of larvae after entering the roots may be due to physiological changes in the plant caused by organic manuring and resulting in a slight resistance. A new method is described for estimating numbers of larvae in roots by milling the whole root system in a Waring Blendor, sieving out and fixing the nematodes and making counts from the suspension. M.T.F.

(117i) The authors describe two methods for the extraction and purification of the substance causing hatching of potato-root eelworm larvae, obtained from potato root diffusate and from the aerial parts of the plant. In the first method high molecular organic material and part of the inorganic materials were removed chemically and the fractions retained were tested for their activity in hatching tests. This method proved unsatisfactory for root diffusate and for leaf extract it was only satisfactory when stopped after the removal of the methanol precipitate. The second method removed inorganic and, possibly, organic material by means of the ion exchangers Amberlite I.R.100, I.R.4B, and sometimes I.R.A400. With this method the active substance was lost from root diffusate on the anion column right at the beginning.

It can be eluted from the columns with a dilute electrolyte. With leaf extract active material is also lost on the anion column in the end. It is concluded that the active substance, or part of it, is probably of an acid nature. There is no proof that the active substances from leaves and in root diffusate are identical.

M.T.M.

(117j) The author carried out experiments with *Hesperis matronalis*, a non-host of *Heterodera schachtii*, which, grown in infested fields, might stimulate larval hatching and cause a more rapid emptying of eelworm cysts than a non-stimulant plant. In laboratory tests *Hesperis matronalis* proved to have a very active root diffusate; it germinates quickly, has a fine fibrous root system and is biennial. In field tests it grew well both without a cover crop and with flax, peas and lucerne, but under wheat and barley there was some dying out. When grown in pots of infested soil the eelworm population declined by 63% as compared with 38% in the control, 54% under *Coronopus ruellii* and 51% under *Matthiola annua*. In field trial the population decline under *H. matronalis* averaged 66% as compared with 38% under cereals. Although cultivation of a hatching plant such as *Hesperis* does not cause disappearance of beet eelworm, it may shorten the period during which beet cannot be grown on infested land.

M.T.M.

(117k) [A fuller account of this work appears in *Ann. appl. Biol.*, **44**, 57-66. For abstract see No. 56d above.]

(117l) Predatory fungi are wide-spread in soils of the Soviet Union. Experimental control of the root-knot nematode by various predatory fungi is reported. The fungi appear to develop predatory properties when the medium is alkaline or neutral but not when acid. The predatory habit is facultative and develops when nematodes are present.

J.B.C.

(117m) Only one species of root-knot nematode, *Meloidogyne marioni* (Cornu), is recognized in Russia, where it is widely spread. From testing some 300 different crop plants five categories of susceptibility are recognized. Chemical control and steam sterilization are practised. *Heterodera rostochiensis* was first found in 1940; chemical treatment of the soil appears to be promising; no resistant varieties are known. Crop rotation and chemical control are used against *H. schachtii*. *H. göttingiana*, *H. major*, *H. humuli* and *Ditylenchus destructus* occur. *D. allii* Beijerinck on onions and *D. phloxidis* Kirjanova are referred to and methods for their control are given.

J.B.C.

(117n) The distribution of *Ditylenchus dipsaci* in Holland is correlated with soil type. Attack on rye occurs in brown sandy soil but not in black sandy soil. On the island of Goeree-Overflakkee the area where onions cannot be grown coincides with the area where the clay content is over 30%. Tabulated data show the decrease in the number of stem eelworms in different soils during winter. In the main, heavy soils have relatively few eelworms of other species whereas light sandy soils contain two to six times as many. *Pratylenchus pratensis*, *Hoplolaimus uniformis* and *Tylenchorhynchus* sp. are common in light soils. *H. uniformis* is rare in clay but *P. thornii* seems to prefer it.

J.B.C.

(117o) Very high numbers of rhabditis can be carried by organic manures. Mushroom mycelium is very sensitive to large *Rhabditis* populations. In mushroom compost and in the casing soil at a critical value (400 to 700 eelworms per c.c. compost) and above, the eelworm population affects mushroom production and fruiting slows and finally stops. An especially close association exists between rhabditids and bacteria, and therefore the role of each in the breakdown of mushroom mycelium is difficult to evaluate. The nematode population changes with time in garden compost is illustrated.

J.B.C.

8—New England Journal of Medicine.

- a. CROCE, E. J., MACGILLIVRAY, W. F. & MURPHY, C. J., 1956.—“Salpingitis due to *Enterobius vermicularis*. Report of a case.” **254** (2), 67–69.
- b. COMBES, B., DAMON, A. & GOTTFRIED, E., 1956.—“Piperazine (Antepar) neurotoxicity. Report of a case probably due to renal insufficiency.” **254** (5), 223–224.
- c. HEINER, D. C. & KEVY, S. V., 1956.—“Visceral larva migrans. Report of the syndrome in three siblings.” **254** (14), 629–636.

(118c) Three cases of visceral larval migrans of varying intensity occurred simultaneously three children in one family. All the cases showed an unusual morphology of the eosinophils the blood and in the bone marrow of two cases, and elevated gamma globulins. One had hepatosplenomegaly and papular rashes. There was a history of dirt eating. R.T.L.

19—New Zealand Journal of Science and Technology. A. Agricultural Research Section.

- a. STANTON, D. J., 1956.—“Effect of steam and of soil disinfectants on yield and quality of Nelson glasshouse tomatoes.” **38** (1), 66–77.

(119a) It is stated that root-knot eelworm was present on chloropicrin-treated plots in tomato-houses even from the first season of treatment, but the infestation, although heavy, was apparently innocuous. Only mild and infrequent infestation was seen on plants from other treatments, including unsterilized plots. M.T.F.

20—New Zealand Medical Journal.

- a. BELTON, C. H., 1956.—“Report on a case of multiple hydatid cysts, hepatic, pulmonary and endocardial.” **55** (305), 62–63.

21—New Zealand Veterinary Journal.

- a. WHITTEN, L. K., 1956.—“The efficiency of phenothiazine against *Trichostrongylus colubriformis* in sheep.” **4** (2), 63–68.

(121a) Trials involving 630 newly weaned lambs were carried out under varying conditions, and confirmed that phenothiazine has a very variable action against *Trichostrongylus*. The effect of particle size on the efficiency of the drug was also considered, and it was shown that a fine suspension of phenothiazine, with the particles less than 10μ in diameter, was significantly more efficient than suspensions in which the particle size was greater than 10μ . There appeared to be no significant difference in the effect of the drug when the particle size was between 10 – 200μ . D.M.

122—Nordisk Veterinaermedicin.

- a. THORSHAUG, K. & ROSTED, A. F., 1956.—“Researches into the prevalence of trichinosis in animals in Arctic and Antarctic waters.” **8** (2), 115–129. [German and Norwegian summaries pp. 127–129.]

(122a) During 1949–53 Thorshaug & Rosted examined 278 polar bears and 74 walrus collected in barrels by skippers of the Arctic Fleet hunting in the Northern, Eastern and Western Ice and part of the Newfoundland grounds. 58.63% of the bears and 7 of the walrus were found to be infected with *Trichinella spiralis*. One out of four dogs was also infected. The specimens of the bearded seal, bladder-nose, Greenland seal, ringed seal, finback, sperm and white whales and Greenland shark and 101 specimens of Ross seal, Weddell seal and leopard seal collected by the crew of the “Norsel” in the Antarctic were all negative. R.T.L.

123—North American Veterinarian.

- a. TURK, R. D., 1956.—“Helminth infections in sheep and goats, with particular reference trichostrongylosis.” **37** (4), 281–282.
- b. ADAMS, E. W., 1956.—“A case of dirofilariasis, with obstruction of hepatic veins.” **37** (4), 299–302.

(123a) Turk briefly discusses the clinical syndrome in sheep and goats known as trichostrongylosis. It is best diagnosed by a post-mortem examination of one or more typical affected animals and a consideration of the case history. Poor nutrition is an important predisposing factor. Removal from contaminated to clean pastures and provision of an adequate level of nutrition are the first considerations.

R.T.I.

(123b) In a dog with adult *Dirofilaria immitis* in the right heart, pulmonary arteries, posterior vena cava and hepatic veins, microfilariae were diffusely distributed in the lung parenchyma, free in the alveoli and in multiple foci of consolidation. The hepatic sinusoids were disrupted and numerous microfilariae were present in the liver which showed marked increase in interlobular connective tissue and hepatic cell degeneration. The case was one of well defined bronchopneumonia with multiple nodules and alveolar exudate containing numerous microfilariae suggestive of an aetiological relationship.

R.T.I.

124—Novedades Científicas. Contribuciones Ocasionales del Museo de Historia Natural La Salle, Caracas. Serie Zoológica.

- a. JORDANO, D. & DÍAZ-UNGRÍA, C., 1956.—“Cestodes de Venezuela II. *Dendrometrus ginesi* (nov. gen. nov. sp.) (Cestoda: Dilepididae) nueva tenia parasita de la tijereta (*Fregata magnificens*).” No. 18, 4 pp. [English summary p. 3.]

(124a) *Dendrometrus ginesi* n.g., n.sp. found in *Fregata magnificens* from Margarita Island, Venezuela, is described and figured. It differs from the related genera *Metroliasthes* and *Rhabdometra* chiefly in the presence of a rostellum, which is rudimentary and unarmed. The gravid uterus is tree-shaped or fungiform, more or less lobed and with a paruterine organ with a rounded end and short penduncle.

M.MCKENNA

125—Parasitology.

- a. CABLE, R. M., 1956.—“*Opistholebes diodontis* n.sp., its development in the final host, the affinities of some amphistomatous trematodes from marine fishes and the allocreadiid problem.” **46** (1/2), 1–13.
- b. SPRENT, J. F. A., 1956.—“The life history and development of *Toxocara cati* (Schrank 1788) in the domestic cat.” **46** (1/2), 54–78.
- c. HORTON-SMITH, C. & LONG, P. L., 1956.—“Studies in histomoniasis. I. The infection of chickens (*Gallus gallus*) with histomonad suspensions.” **46** (1/2), 79–90.
- d. SINHA, P. K. & SRIVASTAVA, H. D., 1956.—“Studies on *Schistosoma incognitum* Chandler 1926. I. On the synonymy and morphology of the blood-fluke.” **46** (1/2), 91–100.
- e. HARVEY, L. A. & CHANNON, C. E., 1956.—“On *Corrigia* (*Orthorchis*) *vieta* (Duj. 1845).” **46** (1/2), 101–106.
- f. JOHRI, L. N. & SMYTH, J. D., 1956.—“A histochemical approach to the study of helminth morphology.” **46** (1/2), 107–116.

(125a) Cable describes and illustrates *Opistholebes diodontis* n.sp. from the intestines of *Diodon hystrix* caught in the coastal waters of Mona Passage, Puerto Rico. It has a well developed glandular disc but may be distinguished from *O. cotylophorus* and *O. adcotylophorus*, the two other members of the genus with glandular discs, by the position of the cirrus sac which is well removed from the ovary, and the vitelline zones which neither coalesce anteriorly nor overlap the gonads posteriorly. During the development from metacercaria to adult the ventral sucker shifts from near the mid-level to the posterior end. Cable considers that the amphistome arrangement in the Opistholebetidae, and probably in the Gyliachenidae and Cephaloporidae, is a secondary character and that none of these families belong in the Paramphistomoidea. A new superfamily, the Opecoeloidea, is proposed for the Opistholebetidae and Opecoelidae which form a natural group set apart from the remainder of the

alloeacridioid complex. *Pachycreadium* is transferred to the Opistholebetidae and may, after further study, be reduced to synonymy with *Maculifer*. S.W.

(125b) Sprent discusses the history, nomenclature and synonymy of *Toxocara cati* and gives a revised list of objective and subjective synonyms and a list of the 26 natural hosts. From his experimental work he concludes that the life-history of *T. cati* represents a basic pattern from which those of other ascaridids of terrestrial mammals have evolved. In cats infected by feeding eggs of *T. cati*, larvae were found in the liver, lungs, tracheal washings and muscles as well as in the digestive tract, whereas in those infected by feeding them with infected mice, larvae were mostly confined to the wall and contents of the digestive tract. The second moult occurred in the stomach wall three to ten days after infection with eggs and six days after infection with mice, the moulting larvae measuring 0.353 mm. to 0.423 mm. long in the former and 0.459 mm. to 0.765 mm. in the latter. In cats infected by either method the third-stage larvae grew in the stomach wall and moulted for the third time at a length of 0.9 mm. to 1.2 mm. about ten days after infection with mice and 19 days after infection with eggs. The smallest fourth-stage larvae occurred in the stomach contents whence they passed to the intestine where the fourth moult took place, the larvae then measuring approximately 4.5 mm. to 5.5 mm. Fourth-stage larvae had lips resembling the adult and sexual differentiation occurred during this stage. The lateral alae gradually disappeared in the adult and the cervical alae reached the adult form at a length of about 45 mm. Eggs were observed in the vagina of a female 55 mm. long and appeared in the faeces 56 days after infection with eggs. All stages are illustrated by text-figures and photomicrographs. Experimental evidence indicated that pre-natal infection did not occur. S.W.

(125c) Horton-Smith & Long have compared the course of infections in chicks produced by histomonad suspensions and by *Heterakis* ova carrying histomonads. Whereas *Heterakis* ova produce infections in feeding chickens, histomonad suspensions do so only in chickens deprived of food for a period before exposure or to which an alkali mixture is given immediately before administration of the suspension. S.W.

(125d) Sinha & Srivastava redescribe and illustrate *Schistosoma incognitum*; *S. suis* Rao & Ayyar, 1933 falls into synonymy with *S. incognitum*. Initially the authors obtained large numbers of male and female worms from slaughtered pigs and subsequently pigs, dogs, cats, sheep, goats, cattle, rabbits and guinea-pigs were infected experimentally and maintained in the laboratory. The male is stout and whitish in colour and has the body divided into two distinct parts, a short cylindrical anterior portion and a longer flat posterior portion with its sides folded ventrally to form the gynaeophoric canal. The cuticle of the posterior part bears minute spines ventrally and is embossed dorsally with scattered tubercles, each bearing 14 to 20 weak spines. The gut caeca reunite an average of 1.49 mm. from the anterior end. The number of testes varies from two to seven, five to seven being the most common. The female is shorter than the male, with a slender, cylindrical body tapering gradually towards the ends. The ovary has a posterior oval portion and an anterior spiral elongated structure which varies considerably in length. There is a single main vitelline duct running ventrally to the common caecum and joining the oviduct near the ootype. S.W.

(125e) Harvey & Channon found 13 of 34 *Apodemus sylvaticus* collected near Exeter to be infected with *Corrigia vitta*. The worms were present in the interlobary canals of the pancreas; the maximum number found in any one mouse was eight, six of the infected mice each harbouring one. The lining of the pancreatic ducts showed no obvious pathological changes. The dimensions of mature, egg-laying worms are tabulated together with the measurements recorded by Baylis and by Baer and are, for the most part, distinctly smaller; this may be due to the method of fixation. The proportions were very variable. The measurements of the eggs (36.9μ by 18.2μ) approached those recorded by Baer (38μ by 23μ). The testes and ovary were variable in shape and the vitellaria were asymmetrically developed. S.W.

(125f) Johri & Smyth describe four histochemical techniques which may be used to demonstrate the vitellaria, vitelline ducts and uterus in many trematodes and pseudophyllidean cestodes. The catechol and diazo techniques may be used both for whole mounts and sections but the bromo-phenol-blue method (based on the affinity of basic proteins for aqueous bromo-phenol-blue) and the malachite green method are suitable only for sections. Although 70% alcohol was found to be the best general fixative for these methods the authors found, surprisingly, that formalin fixation gave excellent results with catechol and that although after fixation in 5% acetic acid the vitellaria gave no positive enzyme test, the hardening eggs in the uterus gave a strong reaction. Detailed instructions for each technique are given and the results obtained with *Fasciola hepatica*, *Diphyllbothrium*, *Schistocephalus solidus* and *Dichodophora merlangi* are described. The evidence suggesting that not all trematodes and pseudophyllidean cestodes harden their egg-shells by quinone tanning is discussed. S.W.

126—Pflanzenarzt. Vienna.

- a. BÖHM, O., 1956.—"Bodenmüdigkeit für Sellerie, ihre Ursachen und ihre Bekämpfung." 9 (2) 12-14.

(126a) A disease of celery in gardens is described. It was found to be associated with the presence of nematodes (unspecified) in the soil. Steaming the soil and applications of D-D mixture both had some effect but best results were obtained following crop rotations. M.T.F.

127—Pflanzenschutzberichte. Vienna.

- a. BÖHM, O., 1956.—"Beitrag zur Kenntnis einer durch Nematoden hervorgerufenen Krankheit der Sellerie." 16, 1-20. [English summary pp. 17-18.]

(127a) A severe disease of celery in eastern Austria appears to be caused by ectoparasitic root nematodes. The plants are dwarfed, the leaves become prematurely yellow and the roots are stunted and bear lesions. In green-house treatments of "celery sick" soil, by steaming and with D-D mixture, much improved growth resulted and the numbers of nematodes were reduced both in the soil and in root samples. Parathion as a drench was less effective. Field experiments gave corresponding results, but steaming was not so efficient. A relationship is shown between degree of injury and numbers of spear-bearing nematodes in the soil, [but the nematodes are not named, except in one case where large numbers of *Paratylenchus* sp. were present]. Injury to roses and spiraea also occurred on "celery sick" soil. The cultivation of cabbage had no effect on the disease of a subsequent crop of celery but lettuce and spinach reduced the disease. Seasonal variations in the numbers of nematodes in soil were observed, the greatest number of spear-bearing types being present in early summer. It is concluded that under field conditions in Austria the best methods of controlling nematode disease of celery are by the application of 1,000 litres per hectare of D-D and by crop rotation. M.T.F.

128—Phytoma. Paris.

- a. HARRANGER, J., 1956.—"Le salsifis de Lunéville, son avenir est-il menacé par les anguilles?" 8 (74), 7-10.

(128a) In this general article on the history and culture of salsify (*Scorzonera*) in the Lunéville district of France, root-knot eelworm is mentioned as the most serious pest. It causes branching of the tap root and galls on the laterals. On heavily infested ground treatment with 1.4 litres of ethylene dibromide per acre reduced the number of unsaleable forked roots from 49% to 17%. M.T.F.

129—Phytopathology.

- a. CHITWOOD, B. G., HANNON, C. I. & ESSER, R. P., 1956.—“A new nematode genus, *Meloidodera*, linking the genera *Heterodera* and *Meloidogyne*.” **46** (5), 264–266.
- b. BIRCHFIELD, W. & MARTIN, W. J., 1956.—“Pathogenicity on sugarcane and host plant studies of a species of *Tylenchorhynchus*.” **46** (5), 277–280.
- c. MARTIN, W. J., NEWSOM, L. D. & JONES, J. E., 1956.—“Relationship of nematodes to the development of *Fusarium* wilt in cotton.” **46** (5), 285–289.
- d. LOWNSBERY, B. F., 1956.—“*Pratylenchus vulnus*, primary cause of the root-lesion disease of walnuts.” **46** (7), 376–379.
- †e. CRITTENDEN, H. W., 1956.—“Resistance of oat varieties to two species of root-knot nematodes.” **46** (8), 466.
- †f. ROHDE, R. A. & JENKINS, W. R., 1956.—“Host range of *Trichodorus* sp. and its host-parasite relationships on tomato.” **46** (8), 469.
- †g. SCHINDLER, A. F. & STEWART, R. N., 1956.—“*Fusarium* wilt of carnations retarded by fungus-eating nematodes, *Ditylenchus* spp.” **46** (8), 469.

(129a) The female of *Meloidodera* n.g. resembles in shape that of *Heterodera rostochiensis* but differs in that it does not become a cyst, although the eggs are retained in the body and the cuticle becomes tough. On the surface the cuticle is marked by striations 2μ apart which form a pattern in the vulvar region resembling that in *Meloidogyne hapla*; internally there are rows of “punctations”. The striae are interrupted in the lateral region with faint signs of a longitudinal groove in the cervical and post-anal areas. The excretory pore is at the base of the neck, behind the oesophageal bulb. The stylet is twice as long as that in *Meloidogyne*, the vulva and anus are quite widely separated and the phasmids are fairly prominent. The larva resembles *H. trifolii* but has fewer head annules and larger phasmids; it differs from *Meloidogyne* in the size of the stylet and phasmids and in the form of the lateral field. *Meloidodera floridensis* n.g., n.sp. was found on the roots of *Pinus elliotii*. There were no root swellings. The females measure $500\text{--}800\mu$ by $220\text{--}400\mu$; the vulva is about two thirds of the distance from head to tail. The anus is subterminal and the phasmids $30\text{--}40\mu$ behind it. A vitelline membrane was observed in the egg and the larva moults before hatching. The hatched larva is $500\text{--}559\mu$ long with stylet $27\text{--}29\mu$ and four head annules. The phasmids are large and circular, $9\text{--}12\mu$ behind the anus. The tail is conoid with blunt tip and the post-protoplasmic region is $23\text{--}35\mu$ long. No males have been found. M.T.F.

(129b) *Tylenchorhynchus martini* Fielding, 1956 is common in the sugar-cane area of Louisiana and has been found in soil from sugar-cane fields in Florida. In experiments carried out by Birchfield & Martin it multiplied greatly on sugar-cane grown in pots of sterilized soil and the roots of the plants were more sparse and more stubby than those of the controls. The green weight of tops and roots was less in infested plants than in controls but in most experiments not significantly so. The authors consider it probable that this nematode might lower sugar-cane yields in the field. Host plant studies show that Johnson grass (*Sorghum halepense*), rice (var. Zenith), sweet potato (var. Unit 1 Porto Rico) and soya bean (vars. Pelican and Acadian) are good hosts. The nematode is probably of economic importance on rice, sweet potatoes and ornamentals. M.T.F.

(129c) Two varieties of cotton, Deltapine 15 (wilt-susceptible) and Coker 100 Wilt (wilt-resistant) were tested with the wilt fungus (*Fusarium oxysporum* f. *vasinfectum*) alone and in combination with pure populations of nematodes and also with the nematodes alone. The nematodes used were *Meloidogyne incognita* (two populations), *M. incognita* var. *acrita*, *Trichodorus* sp., *Tylenchorhynchus* sp. and *Helicotylenchus* sp. The root-knot nematodes significantly increased the incidence of wilt in both varieties of cotton and there was evidence of differences among the *Meloidogyne* populations in their ability to increase the occurrence of wilt. *Meloidogyne* alone caused severe injury but none was observed in the presence of the other nematodes although all reproduced freely on the cotton. M.T.F.

†Abstract of paper presented at the 13th Annual Meeting of the Potomac Division of the American Phytopathological Society, Beltsville, Md., March 1–2, 1956.

(129d) By adding a suspension of *Pratylenchus vulnus* to seedlings of *Juglans hindsii* growing in sterilized soil and also by growing seedlings in soil from an affected orchard, the cause of a walnut disease was shown to be this nematode. The disease is characterized by dieback, stunting and chlorosis, by yield reduction and by root lesions. The potassium content of leaves from diseased seedlings was lower than from healthy ones. J.B.C.

(129e) All varieties of barley and wheat tested were resistant to *Meloidogyne hapla* and susceptible to *M. incognita* var. *acrita*. All oat varieties were resistant to *M. hapla* and the following were resistant to *M. incognita* var. *acrita*, Arlington, Atlantic, Mustang, Lemont, Cross, Coy, Frazier, De Soto, Victorgrain and Victoria. Those susceptible to *M. incognita* var. *acrita* were Forkeddeer, Lee, Latoria, Stanton, Traveller, Fulwin, Arkwin, Lecoute and Dubois. The resistant varieties may be grown for control of this root-knot eelworm either as a winter cover crop or for grain. M.T.M.

(129f) In Maryland about 4.5% of soil samples yielded *Trichodorus* sp. These were on light sandy soils associated with maize, soya bean, tomato or tobacco. Many different plants supported nematode populations in green-house trials. *Asparagus officinalis*, *Crotalaria spectabilis*, *Datura stramonium* and *Euphorbia pulcherrima* were resistant. The stubby root condition in tomatoes appears to be due to cell multiplication in root tips rather than cell destruction. J.B.C.

(129g) Wilt of carnations caused by *Fusarium oxysporum* f. *dianthi* was slightly lessened when large numbers (3,200) of *Ditylenchus* sp. were added to rooted cuttings which were also inoculated with the fungus. J.B.C.

130—Plant Disease Reporter.

- a. GASKIN, T. A. & CRITTENDEN, H. W., 1956.—“Studies of the host range of *Meloidogyne hapla*.” 40 (4), 265–270.
- b. LEWIS, G. D., 1956.—“An outbreak of onion bloat in southern New York.” 40 (4), 271.
- c. WINSTEAD, N. N. & SASSER, J. N., 1956.—“Reaction of cucumber varieties to five root knot nematodes (*Meloidogyne* spp.).” 40 (4), 272–275.
- d. NESBITT, R. B., 1956.—“New host plants of plant parasitic nematodes in California.” 40 (4), 276.
- e. SCHINDLER, A. F., 1956.—“Nematodes associated with roses in a survey of commercial greenhouses.” 40 (4), 277–278.
- f. BIRCHFIELD, W. & BISTLINE, F., 1956.—“Cover crops in relation to the burrowing nematode, *Radopholus similis*.” 40 (5), 398–399.
- g. FOSTER, H. H. & BAXTER, L. W., 1956.—“Studies on control of peach root knot with *Nemagon* in South Carolina.” 40 (5), 400–402.
- h. FIELDING, M. J. & HOLLIS, J. P., 1956.—“Occurrence of plant parasitic nematodes in Louisiana soils.” 40 (5), 403–405.
- i. MARTIN, W. J. & FIELDING, M. J., 1956.—“Some new records of nematode occurrences. The root-knot nematode *Meloidogyne incognita acrita* on sugarcane in Louisiana.” 40 (5), 406.
- j. JENSEN, H. J., TAYLOR, N. & LORING, L. B., 1956.—“Some new records of nematode occurrence. Discovery of the sugar beet nematode in the Milton-Freewater area of Oregon.” 40 (5), 406.
- k. GOHEEN, A. C., MCGREW, J. R. & SMITH, J. B., 1956.—“Tolerance of strawberry plants to hot-water therapy.” 40 (5), 446–451.
- l. ATKINS, J. G. & FIELDING, M. J., 1956.—“A preliminary report on the response of rice to soil fumigation for the control of stylet nematodes, *Tylenchorhynchus martini*.” 40 (6), 488–489.
- m. WALLIN, J. R. & POLHEMUS, D. N., 1956.—“The growth and development of *Phytophthora infestans* from potato tubers in steamed soil.” 40 (6), 534–537.
- n. BENEDICT, W. G., 1956.—“The effect of certain factors on forage crop failures in southern Ontario.” 40 (6), 564–569.
- o. SPEARS, J. F., 1956.—“Occurrence of the grass cyst nematode, *Heterodera punctata*, and *Heterodera cacti* group cysts in North Dakota and Minnesota.” 40 (6), 583–584.
- p. SPEARS, J. F., MAI, W. F. & BETZ, D. O., 1956.—“A case history of the persistence of *Heterodera rostochiensis* Wollenweber in a treated field.” 40 (7), 632–634.
- q. NELSON, R. R., 1956.—“Resistance to the stunt nematode in corn.” 40 (7), 635–639.
- r. MINZ, G., 1956.—“How the potato root nematode was discovered in Israel.” 40 (8), 688–689.

- s. RASKI, D. J., 1956.—“*Pratylenchus penetrans* tested on strawberries grown in black-root-rot soil.” 40 (8), 690–693.
- t. PARKER, K. G. & MAI, W. F., 1956.—“Damage to tree fruits in New York by root lesion nematodes.” 40 (8), 694–699.
- u. SHER, S. A. & RASKI, D. J., 1956.—“*Heterodera fici* Kirjanova 1954 in California.” 40 (8), 700.

(130a) The authors give a list of 64 species of plant, mostly cultivated and in some cases a number of varieties of the species, which have been tested for susceptibility to the root-knot nematode *Meloidogyne hapla*. The susceptibility rating and the number of plants tested are given. All members of the Gramineae showed no infestation and also asparagus, okra, and most varieties of water-melon tested. Most brassicas were moderately to lightly infected and all tomato varieties severely so. The tests indicate that *M. hapla* has a wide host range. M.T.F.

(130b) Field observations indicate that an outbreak of onion bloat caused by *Ditylenchus dipsaci* in southern New York in 1954 was due to the introduction of infested onion sets from the Midwest. M.T.F.

(130c) Fifty varieties and breeding lines of cucumber (*Cucumis sativus*) were tested for resistance to *Meloidogyne incognita*, *M. incognita* var. *acrita*, *M. javanica*, *M. arenaria* and *M. hapla*. All were very susceptible to the first four species but all showed resistance to *M. hapla* varying from a very light infection with egg-laying females to a total absence of them. Two varieties of gherkin (*Cucumis anguria*) were also tested: small gherkin was resistant to *M. hapla* and moderately so to *M. javanica* and *M. incognita* var. *acrita*, while West India gherkin was resistant to all root-knot nematode species except *M. incognita* var. *acrita*. M.T.F.

(130d) *Tylenchulus semi-penetrans* is recorded for the first time parasitizing persimmon (*Diospyros lotus*), and *Pratylenchus scribneri* was found for the first time in rose roots. M.T.F.

(130e) Soil samples from 34 localities in 14 States were examined for nematodes, the samples being taken from areas where roses showed chlorosis and poor growth. *Xiphinema* and *Pratylenchus* occurred respectively in 42% and 44% of the samples examined, and *Xiphinema* were present in moderate to heavy numbers in 60% of the samples in which they were found while *Pratylenchus* occurred in large numbers only half as often. It is felt that these two genera present a problem in commercial rose growing. M.T.F.

(130f) In tests carried out both in slathouses and in constant temperature tanks it was found that *Radopholus similis*, the nematode to which is attributed the decline of citrus trees, lived and multiplied in the roots of *Citrus limon* and *Indigofera hirsuta* but could not be recovered from the roots of *Crotalaria spectabilis* Roth. or *C. striata* DC. grown in soil infested with it. It is concluded that the use of *Indigofera hirsuta* as a cover crop in areas with a history of citrus spreading decline is inadvisable and that *Crotalaria spectabilis*, although less desirable in many ways, might be an important substitute. M.T.F.

(130g) Nemagon (1,2-dibromo-3-chloropropane) was injected during April at 12-inch centres in an area of 100 sq. ft. around peach trees with moderately to severely galled roots (*Meloidogyne* sp.). Injections were at a depth of 12 inches, 3 ml. at a time, and doses of 2.5, 5, 8, 10, 20 and 40 gal. per acre were given. Undiluted Nemagon was used at the highest rate; at the other rates it was diluted with kerosene. On 22nd September records were taken of shoot length, trunk circumference, root-knot symptoms, tree vigour and phytotoxicity. At rates of 5–40 gal. per acre practically no root-knot had been formed on the new roots. Shoot growth, tree vigour and increase in trunk circumference were all good at the 5 gal. rate while the 8 gal. rate showed slightly better nematode control. The optimum treatment appeared to be from 5–8 gal. per acre; at higher rates some damage to the trees was evident. It is pointed out that a number of questions remain unanswered. M.T.F.

(130h) The authors give a table listing plant-parasitic nematodes found in 461 soil samples taken from fields growing 13 different major crops in Louisiana. *Pratylenchus* spp. occurred most often. M.T.F.

(130i) *Meloidogyne incognita* var. *acrita* was found infesting sugar-cane in Louisiana. The galls were very small and the females few, but root rot was pronounced in the presence of the nematodes. M.T.F.

(130j) *Heterodera schachtii* has been found affecting sugar-beet in several fields in the Walla Walla valley in Umatilla County, Oregon. The infestation appears to be an extension of an older infestation caused by the spread of "tare dirt". M.T.F.

(130k) Experiments were carried out to test the tolerance of strawberry plants to warm-water treatments such as are lethal to nematodes. To test the effect of normal winter cold, plants of variety Blakemore were dug from out-door beds at weekly intervals from 22nd November to 4th April, washed in cold water and plunged into water at 127°F. for one, two, four or seven minutes. Those plants dug when air temperatures were lowest survived best. The correlation coefficient between the mean temperature for the 72 hours before digging and the hot-water tolerance was highly significant. In a second series of tests plants were dug on 2nd December, 4th January, 10th February and 3rd March; half were warm-water treated at once and half were stored at 32°F. In all cases storage at 32°F. for two weeks or more increased the warm-water tolerance. Plants dug after 21st March had started to grow and cold storage then had little or no effect on tolerance. A comparison of survival of Blakemore strawberry plants warm-water treated before storage at 32°F., in the middle of the cold storage period or at the end showed that the best time to treat is at the end of cold storage. In a varietal test 55 varieties were compared with Blakemore and most proved to be at least as tolerant of warm-water treatment at 127°F. Cold-stored plants of Empire, Jumbo and Howard 17 were less tolerant than Blakemore. M.T.F.

(130l) Of four nematicides applied to soil, methyl bromide gave better control of *Tylenchorynchus martini* than did ethylene dibromide, D-D mixture or Nemagon. Rice grown in the fumigated soil gave generally better responses to the methyl bromide than to the other nematicides. J.B.G.

(130m) In experiments on the growth and development of potato blight in soil two kinds of saprobic nematodes were found within the diseased plant tissues. J.B.G.

(130n) Detailed investigations were made to determine the cause of failures of first year stands of clovers on sandy loam soils in southern Ontario. In field and green-house experiments applications were made of either an insecticide (Dieldrin), a fungicide (Brassicol), a nematicide (D-D mixture) or an "eradicator" fumigant (Vapam) which kills insects, fungi, nematodes and certain weed seeds. Clovers and grasses were grown and at the end of four months growth was measured by weight of tops. Measurements of soil moisture and temperature in the field were also made. The results indicate that any injurious effects of soil organisms were insignificant and that a period of drought at a critical time in the growth of the plants was of more importance in causing crop failure. M.T.F.

(130o) The 1955 survey for potato-root eelworm in the North Central States of the U.S.A. showed no infestation in Michigan, Wisconsin, Minnesota, North and South Dakota. Cysts of *Heterodera punctata* and of a species belonging to the *H. lacti* group were found, the latter sometimes in large numbers, in samples from North Dakota and Minnesota. M.T.F.

(130p) A field cropped with potatoes in 1944 was fumigated with D-D mixture in 1946. Examination of soil samples for *Heterodera rostochiensis* was carried out before and just after fumigation and then annually until 1955. The level of viable cysts dropped from 26% before fumigation to 7% in 1947 and down to nil in 1955. Evaluation of cyst viability was made by direct examination and by exposure to root leachings. J.B.G.

(130q) Various hybrids, inbreds and single crosses of maize were tested for their susceptibility to *Tylenchorhynchus claytoni* by growing the maize in pots of infested soil. All the hybrids were susceptible as were 21 inbreds and 11 single crosses, showing marked decreases in root weight and shoot weight when exposed to high populations of the nematode. Nine inbreds showed some resistance to attack and had weights of roots and tops similar to those of the controls but had slight reduction of the secondary roots. It appears that in the inheritance of the resistance susceptibility is dominant to resistance. J.B.G.

(130r) When examining soil for other nematodes, cysts of *Heterodera rostochiensis* were found on a smallholding. About 20 cysts were found per 200 gm. of dry soil, some of the cysts containing eggs and larvae. A neighbouring field contained about one cyst per 200 gm. of soil. M.T.F.

(130s) Soil from a field in which strawberries developed black root rot symptoms, and where *Pratylenchus penetrans* was present, was placed in one-gallon jars some of which were fumigated with ethylene dibromide, D-D mixture or chloropicrin, and sealed for 48 hours. After aeration for several days 250 *P. penetrans* per pot were added to some treatments. Strawberries were grown in all pots for 15 weeks, when the total fresh weights and root weights were taken and number of nematodes per gramme of roots estimated. With EDB the nematodes were not eradicated and there was no significant increase in plant weight over the controls. Chloropicrin and D-D both eliminated the nematodes and significant increases in growth occurred. The addition of nematodes after fumigation did not influence the effects of fumigation. The addition of up to 5,000 nematodes per plant in sterile soil had no apparent effect. The fumigation of soil from an apple orchard which did not contain root-lesion nematodes resulted in considerable improvement in the subsequent growth of strawberry plants in it. No ratings were made for root-rot symptoms. It is suggested that *P. penetrans* is probably not the most important factor limiting growth in the black root rot area under investigation. M.T.F.

(130t) When 6,000 *Pratylenchus penetrans* per three-inch pot were added to young seedlings of Mazzard cherry, growth was less than in the controls and the roots became greyish and many died. An average of 1,835 nematodes per plant was found. It is considered that the nematodes are pathogenic. A limited survey of the chief fruit-growing areas along Lake Ontario and in the Hudson River Valley showed large numbers of *P. penetrans* in five sour cherry orchards, one young apple orchard, one pear and one plum orchard, but in the last two there was no apparent relation to poor growth. Counts indicated that where roots are severely damaged the populations of parasitic nematodes are drastically reduced. All the orchards where damage occurred were on light soils. Both Mazzard and Mahaleb root-stocks were damaged. Other roots found infested with *P. penetrans* were *Dactylis* sp., *Digitaria* sp., *Chenopodium* sp. and *Amaranthus* sp. Around the roots of various poorly growing orchard trees large numbers of *Xiphinema* sp., *Criconemoides* sp. and *Paratylenchus* sp. were often found. M.T.F.

(130u) *Heterodera fici* has been found on *Ficus elástica* in six out of seven nurseries in southern California. In green-house tests infections were obtained on *Ficus elastica*, *F. elastica* var. *variegata* and *F. carica* vars. Brown Turkey, Mission, Calimyrna and Kadota. No infections occurred on *Beta vulgaris*, *Brassica oleracea* (cauliflower), *Urtica urens*, *U. gracilis* or *Humulus lupulus*. Identification of the nematode was based on Kirjanova's description (1954) and as it did not infect nettles or hops it is considered not to be identical with *Heterodera humuli* as has been suggested. M.T.F.

131—Plant Pathology. London.

- a. STONE, L. E. W., 1956.—“Cereal root eelworm: a farm survey.” 5 (1), 24-25.
- b. BROWN, E. B. & GOODEY, J. B., 1956.—“Observations on a race of stem eelworm attacking lucerne.” 5 (1), 28-29.

(131a) A survey of 1,200 acres in Wiltshire was carried out by sampling units of 12-15 acres. Fifty samples per unit were taken of which 200 gm. was floated off in the laboratory as four 50 gm. lots. *Heterodera major* was found in 55% of the fields with a mean infestation of 0.022 cysts per gm. Correlation between cropping and eelworm population was good, there was a steady decrease in eelworm population with leys of one, two and three years and analysis showed that there were real differences in the distribution of cysts within fields. J.B.G.

(131b) In Great Britain lucerne var. Grimm is very susceptible to a race of *Ditylenchus dipsaci* which also attacks alsike clover. The variety Du Puits is fairly resistant, other legumes and oats are resistant. The American varieties Nemastan and Synthetic A are resistant but not suited to British conditions. J.B.G.

132—Poultry Science.

- a. EDGAR, S. A.—“The removal of chicken tapeworms by di-n-butyl tin dilaurate.” 35 (1), 64-73.

(132a) Experiments were made on laboratory and field-infected birds to determine the anthelmintic effect of di-n-butyl tin (DBT) dilaurate and certain other compounds. DBT dilaurate administered to the laboratory-infected birds in the feed at 500 mg. per kg. of feed, for two to six days, or by capsule at 75-125 mg. per bird was effective in eliminating *Raillietina cesticillus*, *Choanotaenia infundibulum*, *Davainea proglottina* and *Hymenolepis carioca*. The compound was also highly efficient in field-infected birds when administered as before, in the feed or as a single 125 mg. dose by capsule, or in combination with nicotine and phenothiazine. The above four cestodes were eliminated as well as *R. tetragona* and *Amoebotaenia spheonoides*. A single dose of 300 mg. per bird of DBT dilaurate or a dose of 125 mg. per bird of a combination of DBT dilaurate, nicotine and phenothiazine caused a drop in egg laying up to 10 days after treatment. G-4 (2,2'-dihydroxy-5,5'-dichlorodiphenyl methane) was shown to be highly effective against *C. infundibulum*, less effective against *R. cesticillus* and ineffective against *D. proglottina*. DBT oxide used at the rate of 62.5 mg. per bird was effective against *D. proglottina*, but at 125 mg. caused a drop in food consumption. DBT oxide used at the rate of 32 mg. per bird, or G-4 at the rate of 155 mg. per bird, was effective against *C. infundibulum*, but piperazine hexahydrate at the rate of 1,530 mg. per bird was ineffective against this cestode. D.M.

133—Proceedings of the Helminthological Society of Washington.

- a. HERLICH, H., 1956.—“A digestion method for post-mortem recovery of nematodes from ruminants.” 23 (2), 102-103.
- b. HERLICH, H., DOUVRES, F. W. & ISENSTEIN, R. S., 1956.—“Experimental infections of guinea pigs with *Trichostrongylus colubriformis*, a parasite of ruminants.” 23 (2), 104-105.
- c. ALICATA, J. E. & BONNET, D. D., 1956.—“A study of watercress in Hawaii as a possible source of human infection with liver flukes (*Fasciola*).” 23 (2), 106-108.
- d. GOLDEN, A. M. & TAYLOR, A. L., 1956.—“*Rotylenchus christiei*, n.sp., a new spiral nematode species associated with roots of turf.” 23 (2), 109-112.
- e. EDWARDS, E. E., 1956.—“Studies on resistance to the root-knot nematode of the genus *Meloidogyne* Goeldi, 1887.” 23 (2), 112-118.
- f. READ, C. P., 1956.—“*Trichuris dipodomis*, n.sp., from Ord's kangaroo rat.” 23 (2), 119.
- g. RISER, N. W., 1956.—“Early larval stages of two cestodes from elasmobranch fishes.” 23 (2), 120-124.
- h. JENKINS, W. R. & TAYLOR, D. P., 1956.—“*Paratylenchus dianthus*, n.sp. (Nematoda, Criconeematidae), a parasite of carnation.” 23 (2), 124-127.
- i. THORNE, G. & SCHUSTER, M. L., 1956.—“*Nacobbus batatifformis*, n.sp. (Nematoda: Tylenchidae), producing galls on the roots of sugar beets and other plants.” 23 (2), 128-134.
- j. COIL, W. H., 1956.—“Two new species of microphallid trematodes of the genus *Levinseniella* from charadriiform birds.” 23 (2), 135-137.

- k. COIL, W. H., 1956.—"*Carneophallus muellhaupti*, n.sp., a microphallid trematode from the sanderling from southern Mexico." **23** (2), 138-140.
- l. HIRSCHMANN, H., 1956.—"Comparative morphological studies on the soybean cyst nematode, *Heterodera glycines* and the clover cyst nematode, *H. trifolii* (Nematoda: Heteroderidae)." **23** (2), 140-151.
- m. BROWN, G. L., 1956.—"*Tylenchorhynchus lenorus*, n.sp. Nematoda: Tylenchida), associated with the roots of wheat." **23** (2), 152-153.
- n. HARGIS, Jr., W. J., 1956.—"Monogenetic trematodes of Gulf of Mexico fishes. Part XI. The family Microcotylidae Taschenberg, 1879. (Continued)." **23** (2), 153-162.

(133a) By using the hydrochloric acid-pepsin digestion technique for the separation of trichina cysts from muscle, Herlich has found that many more larval and adult nematodes, which embed themselves in the wall of the gastro-intestinal tract of ruminants, can be recovered than by the ordinary methods followed at post-mortems. R.T.L.

(133b) Experiments have indicated that the guinea-pig can serve as an excellent experimental animal for *Trichostrongylus colubriformis*, since a relatively high percentage of infective larvae reaches sexual maturity and produces viable eggs in these laboratory animals. R.T.L.

(133c) Alicata & Bonnet have surveyed 33 commercial watercress farms, as potential sources of the liver-fluke infections of man in the Hawaiian Islands, from the point of view of the presence of cattle in or near the source of the water supply and the presence and abundance of the molluscan vector *Fossaria ollula*. The results are tabulated and the appropriate control measures are suggested. R.T.L.

(133d) *Rotylenchus christiei* n.sp., collected from soil around roots of Bermuda grass and "spotted spurge weed" in Florida, was presumably feeding on the roots of grasses. The new species differs from others in the genus by the presence of protruding lips each with a cuticular flap on the transverse vulva, the forward position of the phasmids and the presence of two easily visible lines, instead of four, on the lateral fields. R.T.L.

(133e) Extensive tests were made on the susceptibility to root-knot eelworm of 26 species of indigenous and recently introduced plants on the Gold Coast. No infection arose in *Arachis hypogaea*, *Crotalaria retusa*, *C. spectabilis*, *Gossypium hirsutum*, *G. barbadense*, *Oryza sativa*, *Trifolium resupinatum*, *Centrosema pubescens* and *Medicago sativa*, while *Crotalaria juncea*, *C. anagyroides*, *C. striata* and *C. usaramoensis* rarely produced galls. In *Glycine hispida* females with egg masses developed within 30 days of germination but there was little serious distortion of the roots and the extent of malformation varied in different varieties. *Pueraria thunbergiana* developed marked gall formation. *Symphytum peregrinum*, owing to massive root deformities, failed to yield the enormous amount of succulent foliage it normally produces. The Tsolo or the American White varieties of *Zea mays* were very resistant but occasionally showed a few small galls near the tips of young roots. *Sorghum vulgare* offered less resistance. *Phaseolus lunatus* remained relatively free from root malformation. In *Stizolobium deeringianum* grown in heavily infested ground there was little or no indication of gall formation. *Cicer arietinum*, *Lathyrus sativus* and *Vicia villosa* developed severe root lesions. *Solanum tuberosum*, *Urena lobata* and *Leucaena glauca* were susceptible but the galls were comparatively small. Edwards also detected slight infections of *Rotylenchulus* sp. (? *reniformis*) on the roots of *Cicer arietinum*, *Phaseolus lunatus*, *Solanum tuberosum*, *Stizolobium deeringianum*, *Vicia villosa* and *Zea mays*, and heavier infections on *Crotalaria anagyroides*, *C. striata* and *Pueraria thunbergiana*. R.T.L.

(133f) *Trichuris dipodomis* n.sp. from *Dipodomys ordii* in New Mexico, closely resembles *T. opaca* but it has a much coarser spicule and a longer spicule sheath which is spinose in its extended portion, and the female is twice the size. Doubts are cast on Hannum's identification (1942) of *T. minuta* (Rud.) from *Dipodomys* in Arizona as this species is usually parasitic in the opossum. R.T.L.

(133g) Cultures of *Tigriopus fulvus* were successfully infected in the laboratory with oncospheres of *Acanthobothrium hispidum* and *Lacistorhynchus tenuis*. The proceroids of both species are described and illustrated, but *Tigriopus fulvus* cannot be the normal intermediate host as the proceroids were not liberated when the infected copepods were fed to the proper second intermediate hosts.

R.T.L.

(133h) *Paratylenchus dianthus* n.sp. is described and figured. It appears to cause poor growth of green-house carnations. A full differential diagnosis is given. The male occurs frequently and possesses a stylet. The female has no post-vulval sac.

J.B.

(133i) *Nacobbus batatiformis* n.sp. was found on sugar-beet in Nebraska, causing galls like those due to *Meloidogyne*. It also occurs on sugar-beet in Colorado and Wyoming. Tests of 74 plant species in 15 families, 30 species in 9 families became infested. All tested species were susceptible in the Chenopodiaceae, Cruciferae, Cactaceae and Zygophyllaceae; all tested were non-susceptible in the Gramineae, Liliaceae, Malvaceae, Iridaceae, Amaranthaceae and Convolvulaceae. Of nine species tested in Leguminosae only *Pisum sativum* was infested. In Solanaceae, tomato and egg-plant were infested but pepper and potato were not. Larvae enter the small roots of sugar-beet, feed and undergo two moults and leave the roots as pre-adults. At least some make a final moult in the soil, becoming males or young active females. The latter move to larger roots and establish themselves with the head near the central cylinder. The surrounding cells enlarge and a gall develops. The female swells but the posterior part is extended towards an opening on the surface of the root where eggs are discharged into a gelatinous matrix. *N. batatiformis* differs from *N. dorsalis* in that the mature female is spindle-shaped or irregular rather than spheroid anteriorly with a slender, elongated posterior region. The infective female has the distance between vulva and anus about equal to the tail length, whereas it is three times the tail length in *N. dorsalis* and twice in *N. aberrans*. The male tail is about as long as the anal body diameter as compared with $1\frac{1}{2}$ times as long in *N. dorsalis*. *N. batatiformis* differs from *N. aberrans* in that the adult female has a much more strongly developed median oesophageal bulb and corpus and in the infective female the phasmids are near the middle of the tail instead of near the tip.

M.T.L.

(133j) *Levinsemiella leptophallus* n.sp. from *Crocethia alba* in Mexico, has a female pocket like that described for *L. carcinidis*, *L. charadriiformis* and *L. ammicolae* but the pocket in this new species is highly diverticulated, lacks a muscular wall and, by being directly connected to the genital atrium, is separated from the male pocket. *Levinsemiella gymnopocha*, n.sp. from *Erolia alpina pacifica* in Ohio, is characterized as unique because of the position of the entrance of the small male papilla into the male pocket between two of the muscular pockets, whereas in the other species it enters mediad to the four pockets.

R.T.L.

(133k) *Carneophallus muellhaupti* n.sp. from *Crocethia alba* in Mexico, can be differentiated from the two known species by the relatively slight lobulation of the male papilla and the placement of the opening of the ductus ejaculatorius. The new species appears to be an intergradation between *Carneophallus trilobatus* and *Spelotrema papillorobusta*.

R.T.L.

(133l) Hirschmann compared in detail the cysts and contents of *Heterodera glycines* and *H. trifolii*. No differences could be found between the cysts or the eggs. Significant morphological differences were found between the second-stage larvae. The body length in *H. glycines* is $439.6 \pm 6.7 \mu$, in *H. trifolii* it is $496.6 \pm 6.7 \mu$. The stylet is $23.0 \pm 0.1 \mu$ and has the knobs distinctly separated and broader than high in *H. glycines*, while it is $27.5 \pm 0.3 \mu$ with knobs close together, almost as high as broad and apparently hollow anteriorly in *H. trifolii*. The distance of the dorsal oesophageal gland orifice behind the stylet knobs is $4.0 \pm 0.2 \mu$ in *H. glycines* and $7.3 \pm 0.2 \mu$ in *H. trifolii*. The tail of *H. glycines* is $50.4 \pm 1.0 \mu$ and blunter than

in *H. trifolii* where it is $60.3 \pm 1.1 \mu$ long. The tail terminal is $26.6 \pm 0.7 \mu$ in *H. glycines* and $30.7 \pm 0.9 \mu$ in *H. trifolii*. No males of *H. trifolii* were found but morphological details are given for those of *H. glycines*. A hitherto unrecorded structure was observed possibly similar to the hemizonid but extending around the head region five to seven annules behind the labial constriction, situated between the cuticle and hypodermal layer. The structure was seen, though less clearly, in second-stage larvae of both species studied. Statistical analyses of the measurements of the length of five larvae from each of 30 cysts indicate that the measuring of more than three from each cyst does not reduce the variances of the over-all means, nor improve the precision of the mean larval length for each cyst. Further, it is shown that the same precision is reached by measuring one larva from 64 cysts, two from each of 43 cysts or three from each of 36, as with five from each of 30 cysts. M.T.F.

(133m) *Tylenchorhynchus lenorus* n.sp. was found in soil from around wheat roots in a field in Saskatchewan which had been broken the previous year from undisturbed grassland. The new species differs from *T. ornatus* in having a set-off lip region, a conoid-obtuse tail and 24 longitudinal striae in the middle of the body as compared with 32 in *T. ornatus*. It differs from *T. quadrifer* also in having fewer longitudinal striae, and from *T. tessellatus* in being smaller (females 0.63-0.78 mm., males 0.56-0.68 mm. as compared with 0.83-0.94 mm. and 0.89-0.94 mm. respectively) and in having no annulations around the tail tip. M.T.F.

(133n) The subfamily Axininae Monticelli, 1903 which had been combined with Microcotylinae is now restored and emended. *Axinoides raphidoma* n.sp. from the gills of *Tylosurus raphidoma* in Florida, differs from *A. tylosuri* and *A. aberrans* in body size, fewer testes (about 11) and fewer clamps (17) with straighter and stouter dorsal loops. *A. truncatus* n.sp., from *Tylosurus raphidoma* in Florida, is distinguished from all known species by its striking subtriangular body with obliquely situated opisthaptor, the junction of the vaginal duct with the vitello-vaginal reservoir and the more extensive left intestinal rami. *Heteraxine xanthophilis* n.sp. from the gills of *Leiostomus xanthurus* is most closely related to *H. chinensis* but differs in the genital atrium armament, the transverse vitelloducts are shorter and are less dense medially. There are more clamps on the short side. R.T.L.

134—Queensland Agricultural Journal.

a. COLBRAN, R. C., 1956.—“Root-knot nematodes and their control.” 82 (4), 219-223.

(134a) A brief description of the life-history of *Meloidogyne* sp., the symptoms of root-knot diseases and means of spread is followed by a section on control. Measures aimed at reducing soil populations of the nematodes before planting susceptible crops include the use of resistant crops, cultivations to destroy old galls and prevent the growth of susceptible weeds and fumigation with D-D mixture or ethylene dibromide, for which directions are given. M.T.F.

135—Revista Brasileira de Biologia.

- a. LORDELLO, L. G. E., 1956.—“*Meloidogyne inornata* sp.n., a serious pest of soybean in the State of São Paulo, Brazil (Nematoda, Heteroderidae).” 16 (1), 65-70.
- b. CARVALHO, J. C. DE, 1956.—“*Mononchus soutoi* sp.n. (Nematoda, Mononchidae).” 16 (1), 133-134. [English summary p. 134.]

(135a) A new species, *Meloidogyne inornata*, is described from the Campinas region of São Paulo, Brazil. It attacks some soya bean varieties, but the variety La 41-1219 is resistant. It closely resembles *M. incognita* but differs in usually having wider eggs ($37.5-60 \mu$ as compared with $30-38 \mu$), the head of the pre-parasitic larva and of the male has only one wide post-labial annule instead of three, and the excretory pore in the female is further back, between the 17th and 22nd annule from the head. *M. incognita* also differs in that it does attack La 41-1219.

The perineal pattern of *M. inornata* may be confused with that sometimes found in *M. incognita* and therefore provides an example of a species which cannot be identified by this character alone.

M.T.

(135b) *Mononchus soutoi* n.sp. differs from its nearest relative, *M. trionchus*, in its size which is 2.3-2.8 mm. as compared with 4.1 mm., in having the pharynx more than twice as deep as wide and in having a conoid tail with a valved ampulla. It was found in a lake near the city of São Paulo, Brazil.

M.T.

136—Rivista di Parassitologia.

- a. WIBAUT-ISEBREE MOENS, N. L., 1956.—“Une méthode pratique pour détruire *truncatula* hôte intermédiaire de *Fasciola hepatica*.” 17 (2), 77-90. [English & Italian summaries pp.89-90.]
- b. LIPPARONI, E., 1956.—“Ricerche sulla incidenza della ossiurosi con lo ‘Scotch cellophane tape’ (metodo di Graham) fra la popolazione infantile somala dell’età scolare al Villaggio Duemila degli Abruzzi.” 17 (2), 91-95. [English summary p.95.]
- c. RICCI, M. & CORBO, S., 1956.—“Sull’azione dell’adipato di piperazina verso *E. vermicularis* e *A. lumbricoides*.” 17 (2), 97-104. [English summary p.103.]

(136a) From a study of the biology of *Limnaea truncatula* in the Dutch polders the author recommends the application of finely powdered sodium chloride in spring and July for three consecutive years. The molluscs become dehydrated and die almost instantaneously on contact with the salt.

R.T.

(136b) The incidence of *Enterobius vermicularis* in 197 Somali schoolchildren was 52.97% as ascertained by single applications of Scotch cellophane tape.

R.T.

(136c) Piperazine adipate at the rate of 1.8 gm. of active substance daily for two to five days whether administered in solution, as suspension or in tablets, showed no substantial differences in activity when given to children of school age. The percentage of cures increased with the number of days of treatment from 70.37% after two days to 94.05% after five days. 36 adults with *Ascaris* infection were given a single dose of 4 gm. in solution followed next day by 20 gm. of sodium sulphate. No eggs could be found in the faeces in 94.44% after treatment. Piperazine adipate had no effect on two cases of *Hymenolepis nana*. The eggs of *Trichuris trichiura* disappeared from 24 individuals after treatment.

R.T.

137—Schweizer Archiv für Tierheilkunde.

- a. LEEMANN, W., 1956.—“Parasitäre Erkrankungen beim Schwein.” 98 (2), 60-65. [English & French & Italian summaries p. 65.]

(137a) Leemann summarizes the damage caused by helminths in pigs and outlines the various life-cycles and methods of treatment. He considers that control can only be attained by simultaneous prophylaxis and treatment.

R.T.

138—Scientific Survey of Porto Rico and the Virgin Islands.

- a. CABLE, R. M., 1956.—“Marine cercariae of Puerto Rico.” 16 (4), 491-577.

(138a) The fifty-one species of cercariae described in this report were obtained from 22 marine molluscs collected on the coasts of Puerto Rico. Each is named *Cercaria caribbea* followed by a Roman numeral in the order in which it is considered in the text. Preceding the descriptions of the individual species there is a key to the various groups and species. *Cercaria caribbea* I is a monostome; *C. c.* II and III are echinostomes; *C.c.* IV, V and VI are echinostome-like gymnocephalous cercariae; *C.c.* VII, VIII and IX are gymnocephalous

roglotrematids; *C.c.* X, XI, XII, XIII, XIV, XV, XVI, XVII, XVIII and XIX are opisthorchiids; *C.c.* XX, XXI, XXII, XXIII and XXIV are opecoelids; *C.c.* XXV, XXVI, XXVII, XXVIII, XXIX, XXX and XXXI are microphallids; *C.c.* XXXII and XXXIII are plagiostomids; *C.c.* XXXIV is a hemiuroid; *C.c.* XXXV and XXXVI are monorchiids; *C.c.* XXXVII is a megaperid; *C.c.* XXXVIII is a haploplanchnid; *C.c.* XXXIX, XL and XLI are fellostomatids; *C.c.* XLII is a bucephalid; *C.c.* XLIII, XLIV, XLV, XLVI, XLVII, XLVIII are bivesicolids; *C.c.* XLIX is a schistosomatid; and *C.c.* L and LI are cyathocotylids. There are 117 figures on 16 plates. The molluscan hosts listed are *Astraea imbricata* (*C.c.* XXI), *Batillaria minima* (*C.c.* XXXI and XXXIII), *Bittium varium* (*C.c.* XIII and XIV), *Cerithidea costata* (*C.c.* I, II, III, V, X, XI, XII, XV, XIX, XXXII, XXXIII and XLIX), *Cerithium ulgicola* (*C.c.* VIII, XVI, XVIII, XXX, XLIV, XLV, XLVI, L and LI), *Cerithium literatum* (*C.c.* LI), *Cerithium muscarum* (*C.c.* VI, XLVII and XLVIII), *Cerithium variabile* (*C.c.* IX, XV, XIX, XXVI, XXX, XXXVIII and XLII), *Crepidula convexa* (*C.c.* XXXVII), *Diodora cayenensis* (*C.c.* XX), *Donax denticulata* (*C.c.* XLI), *Macoma cerina* (*C.c.* XXXV), *Nerita tessellata* (*C.c.* XXVII), *Neritina virginea* (*C.c.* XXVIII), *Nitidella cribraria* (*C.c.* XXIII), *Pyrene mercatoria* (*C.c.* XXXIV), *Tegula fasciata* (*C.c.* VII and XXIV), *Tellina lineata* (*C.c.* XLI), *Tellina martinicensis* (*C.c.* XL), *Tellina pauperata* (*C.c.* XXXIX), *Turbo castaneus* (*C.c.* XXII) and *Turritella exoleata* (*C.c.* IV and XVII). The number of cercariae found is considerably fewer than that for the adult trematodes collected and now being identified. R.T.L.

139—Scottish Agriculture.

- a. ANON., 1956.—“A new technique. Chemical control of potato root eelworm.” 35 (4), 229.

(139a) Soil of small plots and glass-houses can be freed from *Heterodera rostochiensis* if injected with D-D mixture at the rate of 400 lb. per acre, raked level to close the injection holes and watered with two gallons per sq. yd. of solubilized xylenol, 1 in 100. The plants were not tainted and the combined treatment costs about £95 per acre. R.T.L.

140—Semana Médica. Buenos Aires.

- a. KEMPSKI, H. W., 1956.—“Nuevos conceptos de broncopatías y parasitosis sobre todo en relación al cuadro asmático en niños.” 108 (1), 1-5. [English summary pp. 4-5.]
b. BONDUEL, A. A., PRIETO, M. M., MERONI, R. J. & GIUSSANI, A. A., 1956.—“Dos casos de fibrosis hepática en quistes hidatídicos que no comprimen las vías biliares.” 108 (4), 131-133.

(140a) As a result of clinical and faecal examination of 5,169 youths Kempiski believes that asthmatic symptoms in children are attributable to the damage caused by the migration of the larvae of *Ascaris lumbricoides* and hookworm through the lungs. The extraordinary lack of calcium characteristic of intestinal parasitism is a contributory factor. In massive infections spastic diathesis, based on disturbance of calcium metabolism, could be observed. No symptomatic therapy is needed if anthelmintic treatment is given. R.T.L.

141—Shikoku Acta Medica.

- a. YAMAGUCHI, T., TOYODA, H. & MURAKAMI, K., 1956.—[On the geographical distribution of hookworm in Shikoku Island. Part 1. Survey of hookworm in Tokushima Prefecture.] 8 (1), 7-11. [In Japanese: English summary p.7.]

(141a) A map indicates the geographical distribution of hookworm in Tokushima Prefecture and tables give the incidence of *Ascaris*, hookworm and whipworm ova found in examinations at Gamoda, Kawahigashi, Kainancho and Kawanishi. Of 4,120 hookworms examined 91.4% were *Ancylostoma duodenale* and 8.6% were *Necator americanus*. The highest number of *A. duodenale* found in a single case was 344. R.T.L.

142—South African Medical Journal.

- a. LURIE, H. I. & DE MEILLON, B., 1956.—“Experimental bilharziasis in laboratory animals. III. A comparison of the pathogenicity of *S. bovis*, South African and Egyptian strains of *S. mansoni* and *S. haematobium*.” 30 (4), 79–82.

(142a) *Schistosoma bovis* is more pathogenic for mice than for monkeys or guinea-pigs. *S. haematobium* is only feebly pathogenic for mice. The South African and Egyptian strains of *S. mansoni* are more pathogenic for mice and for *Mastomys* than for monkeys. The lesions appear earlier in *Mastomys* than in mice. The lungs are frequently involved in mice but not in monkeys. There is no significant difference in reaction between mice and *Mastomys*. In monkeys *S. bovis*, *S. African S. mansoni* and Egyptian *S. mansoni* infections do not progress beyond the formation of early granulomata and phagocytosis of the eggs. In mice *S. bovis* and Egyptian *S. mansoni* infections run an almost identical course while South African *S. mansoni* infections show only minor differences in that hepatitis and granulomata take a few weeks longer to appear while lung lesions are not seen until several weeks later. *Mastomys* is an excellent laboratory animal. In it the Egyptian *S. mansoni* produces proliferation of the bile-ducts and lungs whereas the South African *S. mansoni* does not.

R.T.L.

143—Svensk Frötidning.

- a. BINGEFORS, S., 1956.—“Finska undersökningar av klövernematodförekomst i frö.” 25 (2), 29–30.

(143a) Investigations in Finland of the occurrence of *Ditylenchus dipsaci* in clover seeds are discussed. A comparison with results from other countries indicates that there must be serious mistakes in the determinations of species in the Finnish investigations. Figures given seem to be the total number of nematodes, not the number of *Ditylenchus dipsaci*. S.B.

144—Tierärztliche Umschau.

- a. SPREHN, C., 1956.—“Die Wirkung kleiner Phenothiazin-Gaben in Form eines Lecksteiness bei Trichostrongyliden-Befall der Wiederkäuer.” 11 (1), 3–5.
 b. BARTELS, K. P., 1956.—“*Capillaria plica*-Befall bei einem Hunde.” 11 (4), 139–140.
 c. BOCH, J., 1956.—“Zur Epidemiologie und Bekämpfung des Magenwurmbefalls der Wiederkäuer.” 11 (5), 161–164.

(144a) Sprehn reports on a pilot experiment on stalled goats to determine the value of a lick containing phenothiazine in the control of stomach worm infection. The goats, kept on straw which was maintained throughout the winter in as dry a state as possible, consumed the lick willingly. Judged by egg counts a lick containing 10% phenothiazine reduced infection by 94.5%, while one containing 5% phenothiazine brought about a reduction of 86%. Infection in the controls (which received no lick), was reduced by only 24.5%. The experiments also demonstrate that the maintenance of animals on dry straw, even without other measures, decreases the intensity of infection.

A.E.F.

(144b) As *Capillaria plica* is seldom seen in Germany, Bartels reports a case in a three-year-old cocker spaniel and gives a brief résumé of the biology and pathology of this infection.

R.T.L.

(144c) Boch reports that 58% of 20,000 head of cattle in the pasture districts of the Bavarian alps were found to carry stomach worms. Sheep kept on high ground (altitudes of 1,100 to 1,900 metres) had an almost 100% infection, and 70% of roe-deer and chamois and 94% of roe-deer examined were positive for stomach worms. Since even light infections have an adverse effect on milk, meat and wool yields, Boch urges the need for preventive measures with special emphasis on spring and autumn treatment of all infected animals, adequate pasture and stall hygiene, and sound nutrition.

A.E.F.

145—Tijdschrift over Plantenziekten.

- a. SEINHORST, J. W., 1956.—“Biologische rassen van het stengelaaltje *Ditylenchus dipsaci* (Kühn) Filipjev en hun waardplanten. I. Reacties van vatbare en resistente planten op aantasting en verschillende vormen van resistentie.” 62 (4), 179–188. [English summary pp. 187–188.]
- b. OOSTENBRINK, M., 1956.—“Over de invloed van verschillende gewassen op de vermeerdering van en de schade door *Pratylenchus pratensis* en *Pratylenchus penetrans* (Vermes, Nematoda), met vermelding van een afwijkend moeheidsverschijnsel bij houtige gewassen.” 62 (4), 189–203. [English summary pp. 201–203.]

(145a) When a compatible race of *Ditylenchus dipsaci* attacks host plants they feed and multiply. The plant reacts by swelling of the infested tissue where the middle lamellae of cells are dissolved. Stunting, malformation and lateral bud development may all occur. Abnormal symptoms may be shown by plants attacked by a non-compatible race of *D. dipsaci* as necrosis, stunting and malformation but no dissolution of the middle lamellae or penetration into the tissues, or some penetration by eelworms causing abnormal symptoms. The abnormal plant reactions may be considered as types of resistance. Slow development of symptoms and very slow development of eelworms is another type of resistance. There is a vital correlation between dissolution of the middle lamella and feeding and multiplication. J.B.G.

(145b) Eleven test crops, potato, oats, rye, beet and seven woody perennials were grown for two years in two test fields containing mixed populations of *Pratylenchus pratensis* and *P. penetrans*. The third year, rose, potato, rye and young apple trees were grown across all the plots. Population changes were followed in the soil and roots and the effects on the crops observed. Roots of all the plants were attacked by both pratylenchs. The results are presented in two tables and, in the text, comments are made on the advisability or not of following certain rotations. J.B.G.

146—Transactions of the American Microscopical Society.

- a. RAUSCH, R., 1956.—“Studies on the helminth fauna of Alaska. XXVIII. The description and occurrence of *Diphyllbothrium dalliae* n.sp. (Cestoda).” 75 (2), 180–187.
- b. WONG, L. W. & WAGNER, E. D., 1956.—“Some effects of ultraviolet radiation on *Oncomelania nosophora* and *Oncomelania quadrasi*, snail intermediate hosts of *Schistosoma japonicum*.” 75 (2), 204–210.
- c. CAMPBELL, W. C. & TODD, A. C., 1956.—“Emission of cercariae and metacercariae in snail feces.” 75 (2), 241–243.
- d. SINGH, K. S., 1956.—“*Hymenolepis vogeei* n.sp., from an Indian field mouse, *Mus buduga* Thomas, 1881.” 75 (2), 252–255.

(146a) *Diphyllbothrium dalliae* n.sp. was obtained experimentally by feeding a glaucous-winged gull, *Larus glaucescens*, and a dog with plerocercoids from the blackfish, *Dallia pectoralis*, from the lower Kuskokwim River, western Alaska, where 79% of the fish were infected. The natural definitive host is still unknown. The plerocercoid larva of *Diphyllbothrium dalliae* is unique in that it occurs free in the body-cavity of the fish, and is often visible through the abdominal wall. R.T.L.

(146b) Experiments are described in which ultra-violet light inhibited the development of the eggs of *Oncomelania nosophora* and *O. quadrasi* and the adult snails died within a month. R.T.L.

(146c) As no previous record of the presence of cercariae and metacercariae in snail faeces had appeared in the literature on cercarial emission Campbell & Todd describe the passage of immature, mature and encysted cercariae in the faeces by a *Stagnicola reflexa* experimentally infected *Fascioloides magna*. R.T.L.

(146d) *Hymenolepis vogeei* n.sp. from *Mus buduga* differs from *H. anthocephalus* in the size of the strobila and scolex, in having a seminal receptacle and an unarmed cirrus and from *H. scalopi* in the size and position of the cirrus-pouch and the small size of the rostellum and eggs. The number and position of the testes in *H. vogeei* show an unusual degree of variation which has no particular pattern. R.T.L.

147—Transactions of the Royal Society of Tropical Medicine and Hygiene.

- a. MINNING, W. & McFADZEAN, J. A., 1956.—“Serological investigations in an area of endemic filariasis due to *Wuchereria bancrofti* and *Acanthocheilonema perstans* in Gambia, West Africa.” 50 (3), 246–254.
- b. RIDLEY, D. S., 1956.—“The complement-fixation test in filariasis.” 50 (3), 255–257.
- c. NEWSOME, J., 1956.—“Problems of fluke immunity: with special reference to schistosomiasis.” 50 (3), 258–274.
- d. SCHWETZ, J., 1956.—“Rôle of wild rats and domestic rats (*Rattus rattus*) in schistosomiasis of man.” 50 (3), 275–282.

(147a) Minning & McFadzean carried out serological investigations in Gambia in an area of endemic filariasis due to *Wuchereria bancrofti* and *Acanthocheilonema perstans*. Alcoholic extracts of powdered *Dirofilaria immitis* were used as an antigen. This antigen had been previously tested in Hamburg and no false positives had been recorded. In Gambia 57% of 51 persons with microfilariae of *W. bancrofti* alone gave positive reaction. Three possible explanations are given for the negative reactions in the remaining 43% of cases. (i) That as the antigen employed was not homologous it failed in some cases to give an optimal reaction with the antibodies present. (ii) That free antibodies might be absent periodically from the blood if they were adsorbed on to the microfilariae, or neutralized by an antigenic fluid from the adult worms, or if there was damage to the reticulo-endothelial system by metabolic products of the parasites. (iii) That as the parasites are so well adapted to their host, there is sometimes a poor level of production of antibodies. Of 24 persons with microfilariae of *A. perstans* only, 25% gave a positive reaction. Of 13 persons with both microfilariae of *W. bancrofti* and *A. perstans* 23% gave a positive reaction. Of 159 persons who lived in the endemic area studied but had no microfilariae in the blood, 33% gave a positive reaction. An alcoholic extract of *Ascaris* larvae was used as an antigen to determine if an *Ascaris lumbricoides* infection influences the filarial complement fixation test. There was no evidence of any influence.

D.L.H.R.

(147b) Ridley confirms Fairley's (1931) work on the use of an alcoholic extract of desiccated *Dirofilaria immitis* powder as an antigen for complement fixation tests in filariasis. He found that it gave a group reaction and that the only really satisfactory results were in loaasis. No false positives were recorded. Ridley concludes that the early diagnosis of filariasis should, where possible, be based on three laboratory investigations besides the clinical findings, namely, the eosinophil count, the skin test and the complement fixation test. Eosinophilia and a positive skin test are usually present in any sort of filariasis; their absence is enough to make the diagnosis improbable, but only the complement fixation test, when positive, is sufficiently specific to establish it.

D.L.H.R.

(147c) Newsome has reviewed the problems of fluke immunity mainly with regard to schistosomiasis. After discussing the evidence of resistance in man and animals, the properties of resistance to schistosomiasis are described and those requiring investigation are listed. Proposals for new work are discussed mainly under the headings of action of resistance on developmental stages, antigens and antibodies. He concludes that the fundamental factors and mechanisms in the natural and acquired resistance in man need further investigation before good policies for treatment and prevention in different populations can be evolved with confidence. The results may well show that control schemes which fail to take account of the resistance or immunity of the population are playing with fire.

D.L.H.R.

(147d) In view of the existence of *Schistosoma mansoni* var. *rodentorum*, Schwetz raises the question as to whether rodents were the primitive hosts of *S. mansoni* which thereafter adapted itself to human beings. In an attempt to shed some light on the problem he examined rodents in localities of the Belgian Congo where there were foci of infection with *S. mansoni*, *S. rodhaini*, *S. haematobium* and *S. intercalatum*. With the exception of one rodent at Irumu none were found parasitized with *S. mansoni* var. *rodentorum*. A list is given of rodents which were found to be parasitized with *Capillaria hepatica* (*Hepaticola hepatica*).

D.L.H.R.

147—Transactions of the Royal Society of Tropical Medicine and Hygiene (cont.)

- e. GELFAND, M., 1956.—"Tropical eosinophilia in Rhodesia." 50 (3), 283–286.
- f. BARBOSA, F. S., COELHO, M. V. & CARNEIRO, E., 1956.—"Cross-breeding of *Australorbis glabratus* and *Biomphalaria boissyi*." [Correspondence.] 50 (3), 296–297.
- g. YEH, L. S., 1956.—"Morphological differentiation of *Dipetalonema caudispina* and *D. gracile*." [Demonstration.] 50 (4), 302–303.
- h. EDESON, J. F. B. & BUCKLEY, J. J. C., 1956.—"A mixed infection, in the blood of a Malayan dog, of microfilariae of *Dirofilaria immitis* and *Wuchereria* sp. of the 'malayi' type." [Demonstration.] 50 (4), 304.
- i. JAMISON, D. G. & KERSHAW, W. E., 1956.—"Measurements of the skin changes in onchocerciasis." [Demonstration.] 50 (4), 305.
- j. DUKE, B. O. L. & GORDON, R. M., 1956.—"The escape of the microfilariae of *Loa loa* into the haemorrhage produced by the feeding *Chrysops silacea*." [Demonstration.] 50 (4), 305.
- k. RIDLEY, D. S. & HAWGOOD, B. C., 1956.—"The formol-ether method of concentrating faecal cysts and ova." [Demonstration.] 50 (4), 305.
- l. JARRETT, W. F. H. & URQUHART, G. M., 1956.—"The pathogenesis of bovine parasitic bronchitis." [Demonstration.] 50 (4), 306.
- m. JARRETT, W. F. H. & URQUHART, G. M., 1956.—"Oesophageal sarcomata associated with *Spirocerca lupi* infection in the dog." [Demonstration.] 50 (4), 306.

(147e) Gelfand records details of two patients, a man and a boy, with eosinophilia which could not be attributed to helminth or protozoal disease. Treatment of the man with N.A.B. and the boy with stovarsol were both successful. He stresses that one should not be too ready to treat a person with blood eosinophilia for a helminthic infestation unless strong evidence of such infestation exists. D.L.H.R.

(147f) Barbosa, Coelho & Carneiro found that the planorbid vector of *Schistosoma mansoni*, from Cairo, known as *Biomphalaria boissyi* would interbreed with *Australorbis glabratus* the vector of the same disease in Recife, Brazil. Fertilization occurred among the progeny and Mendelian segregation was observed by mating an albino monozygous specimen of *A. glabratus* with a pigmented *B. boissyi*. The results indicate that these two species have a common gene pool. D.L.H.R.

(147g) Yeh differentiates *Dipetalonema caudispina* from *D. gracile* by the following characters: the male of *D. caudispina* has a stouter tail, the post-cloacal papillae are pronounced, the last pair being large and distinct. The tip of the left spicule is stout and alated and the proximal part is heavily chitinized and pitted. The distal part is 1 to 2 times the length of the proximal part. R.T.L.

(147h) In Malayan dogs the unsheathed microfilaria of *Dirofilaria immitis* and a sheathed microfilaria resembling that of *Wuchereria malayi* occur as a mixed infection. R.T.L.

(147i) The dimensions of normal skin and those of the skin in onchocerciasis show evident deviations. R.T.L.

(147j) The microfilariae of *Loa loa* taken up by a feeding *Chrysops silacea* are derived from extravasated blood, not directly from a capillary. R.T.L.

(147k) A simplified formol-ether technique was demonstrated. It concentrates all ova without distortion and takes only five minutes to perform. R.T.L.

(147l) The pulmonary lesions in *Dictyocaulus viviparus* infections in cattle during the prepatent period, the early patent phase and in the post-patent period are described. Severe interstitial emphysema may occur at any stage. Even when lungworms have disappeared from the bronchi the marked epithelialization of alveoli causes respiratory symptoms. R.T.L.

147—Transactions of the Royal Society of Tropical Medicine and Hygiene (cont.)

- n. SCHWETZ, J., 1956.—“ Demonstration of a collection of various African lake and river snail intermediate hosts of schistosomes of man and animals.” [Demonstration.] 50 (4), 306-309.
- o. GOODWIN, L. G., 1956.—“ Action of drugs in *Ascaris* in vitro.” [Demonstration.] 50 (4), 310.
- p. NEWSOME, J. & ROBINSON, D. L. H., 1956.—“ Reactions of *Schistosoma mansoni* eggs and schistosomulae to immune serum.” [Demonstration.] 50 (4), 310-311.
- q. WADDY, B. B., 1956.—“ Organization and work of the Gold Coast Medical Field Units.” 50 (4), 313-336. [Discussion pp. 337-343.]
- r. SMITHERS, S. R., 1956.—“ On the ecology of schistosome vectors in the Gambia, with evidence of their rôle in transmission.” 50 (4), 354-365.

(147n) At this demonstration Schwetz exhibited the following molluscs as schistosome intermediate hosts from various African lakes and rivers: *Planorbis tanganyicensis* and *P. tanganikanus* from Lake Tanganyika; *P. kivuensis* from Lake Kivu; *P. alberti*, *P. ? stanleyi* and *P. ? choanomphalus* from Lake Albert; *P. smithi* from Lake Edward (and *P. edwardi* from its marshy shores), from Kazinga channel and from Lake George and Lake Bunyonyi. With the exception of *Planorbis smithi* all these lake *Planorbis* are intermediate hosts of *Schistosoma mansoni*. All the various river *Planorbis* belong to the species *Planorbis pfeifferi* which has numerous synonyms. All the varieties of *Physopsis africana*, including *P. nasuta*, are intermediaries of *S. haematobium*, *S. bovis* and *S. intercalatum*. In a postscript it is argued that the generic names *Biomphalaria*, *Afroplanorbis*, *Planorbarius* and *Australorbis* are no more useful than the numerous specific names given to African species of *Planorbis*. R.T.L.

(147o) Tracings of the movements of *Ascaris lumbricoides* caused by slow-acting drugs e.g. piperazine, hexylresorcinol, thymol, oil of chenopodium and tetrachlorethylene were obtained by suspending the worm in Locke's solution at 37°C. after enclosing it in a thin nylon stocking, of which the upper end was attached to a lever recording on a smoked drum and the lower end weighted. R.T.L.

(147p) Precipitates form at the oral sucker and excretory pore of schistosomulae of *Schistosoma mansoni* 14 to 21 days old, when incubated in immune serum for 48 hours at 37°C., but not in older or younger forms. It is suggested that this is partly responsible for the massacre of invading flukes believed to occur in normal and immune hosts at about the 10th to 14th day after infection. The formation of precipitates in the form of globules on the egg-shell which Oliver-González observed when schistosome eggs are incubated in immune sera is confirmed. R.T.L.

(147q) In this account of the Gold Coast Medical Field Units, Waddy states that the endemic areas of onchocerciasis blindness in West Africa are riverine environments throughout the entire inside of the Niger bend, which includes the north of the Gold Coast, and east of that into French Equatorial Africa, between latitudes 9° and 14°N. In the long courses of the Black, White and Red Volta rivers in the north of the Gold Coast the infection is hyper-endemic and extends into the French Upper Volta Colony. The principal vector, *Simulium damnosum*, has an extremely long flight range which is likely to vitiate any piecemeal attempts to eradicate it. The incidence of guinea-worm is nearly 100% in parts of the Gold Coast and this is one of the three most important diseases which should have priority in eradication. Schistosomiasis although wide-spread is remarkably mild. In the eastern Northern Territory its incidence in the north is almost 100% while in the south it is not endemic. R.T.L.

(147r) Smithers has studied the oecology of snails in the Bansang Bassa and Kartung areas of the Gambia and investigated their role in the transmission of human schistosomiasis. *Bulinus* (*Phys.*) *jousseau mei* was found in clear cool slow-flowing water, attached to the under surface of water-lily leaves. This snail was found to be shedding cercariae of *Schistosoma haematobium*. *Bulinus* (*B.*) *guernei* was found mainly at Kumbija among green algae growing

17—Transactions of the Royal Society of Tropical Medicine and Hygiene (cont.)

- s. BUDDEN, F. H., 1956.—“The epidemiology of onchocerciasis in Northern Nigeria.” 50 (4), 366–378.
- t. CROSSKEY, R. W., 1956.—“The distribution of *Simulium damnosum* Theobald in Northern Nigeria.” 50 (4), 379–392.
- u. HAWKING, F., 1956.—“The periodicity of microfilariae. IV. Stimuli affecting the migration of the microfilariae of *Dirofilaria aethiops*, *D. immitis*, *D. repens*, *Dipetalonema blanci* and *Litomosoides carinii*.” 50 (4), 397–417.
- v. HEISCH, R. B., GOINY, H. H. & IKATA, M., 1956.—“A new vector of filariasis in East Africa.” [Correspondence.] 50 (4), 421–422.

long the sides of the channels or on dead wood and palm fronds on the bottom. It also was found to be a natural vector for *S. haematobium*. *Bulinus* (Phys.) *globosus* was found only once and further study is required to determine whether it is effecting transmission. *Bulinus* (*B.*) *senegalensis* was found in profusion confined to the laterite pools where it has to withstand high temperatures, a deficiency in mineral salts and severe drought for 6 or 7 months every year. This snail was acting as intermediate host for both *S. haematobium* and *S. bovis*. *Bulinus* (*B.*) *forskali* was found in a variety of habitats but not in laterite pools; it was always uninfected. Although there is a focus of *S. haematobium* at Kartung and *B. forskali* is the only possible vector in the locality none were found to be infected. Laboratory-bred *B. forskali* were however found to be receptive to *S. haematobium* and *S. bovis*. Although there is no known focus of *S. mansoni* in Gambia its potential vector *Biomphalaria pfeifferi gaudi* was found. Reference is also made to the finding of *Biomphalaria p. gaudi*, *B. jousseamei*, *Bulinus guernei* and *B. forskali* (all potential schistosome vectors) in the River Casamance. D.L.H.R.

(147s) Onchocerciasis is endemic in all of the twelve Provinces of Northern Nigeria; its northern limit is at about 13°N. The rivers where either the disease or the vector *Simulium damnosum* has been reported, and the intensity of infection associated with each river, are tabulated. It is estimated that about one third of a million individuals suffer from onchocerciasis and about 20,000 of these are blind. R.T.L.

(147u) In order to study the stimuli which cause microfilariae to enter or leave the peripheral blood, Hawking produced changes in the internal environment of monkeys infected with *Dirofilaria aethiops* (a new species), dogs infected with *D. immitis* and *D. repens*, gerbils infected with *Dipetalonema blanci* and cotton-rats infected with *Litomosoides carinii* and with *Dirofilaria aethiops*. A rise in the count of microfilariae in the peripheral blood was caused during day and night by changes in the oxygen pressure and by anaesthetics. Increase during the day could be brought about by infusion of ammonium chloride or increase of carbon dioxide concentration; decrease at night could be caused by hyperventilation, by exercise or by infusion of ammonium chloride or sodium bicarbonate. The reactions of the microfilariae of *D. immitis* and *D. repens* were similar to those of *D. aethiops* except that exercise at night probably causes a rise of the count in the peripheral blood. With *Dipetalonema blanci* a rise in the microfilarial count was caused by increased oxygen or by anaesthetic; but with *L. carinii* these stimuli have no effect or cause a fall respectively. D.L.H.R.

(147v) There is a high incidence of microfilariae, and elephantiasis of the legs is common, in the inhabitants of the Island of Patta off the coast of Kenya. 7% of the *Aedes aegypti* and 14% of the *Culex fatigans* caught in the houses contained filarial larvae but only in the immature stage and none were present in the proboscis. As 6% of the predominant local mosquito, *Aedes pemmaensis*, were infected and showed proboscis infections, it is suggested that this species is an important vector of bancroftian filariasis. But as infected *A. pemmaensis* were also found in the bush their filarial larvae may have had some animal origin. R.T.L.

147—Transactions of the Royal Society of Tropical Medicine and Hygiene (cont.)

- w. McFADZEAN, J. A., 1956.—“Enteric-coated tablets of banocide.” [Correspondence.] 50 (4), 424.
- x. DISSANAIKE, A. S., DISSANAIKE, G. A. & NILES, W. J., 1956.—“Infective filarial larvae tagged with phosphorus-32.” [Correspondence.] 50 (4), 425.

(147w) Banocide was administered in enteric-coated tablets, in a syrup, and as a draught with sodium bicarbonate, in the hope that the nausea and vomiting caused by this drug might be avoided, but the gastro-intestinal upset was not averted.

R.T.L.

(147x) In a preliminary note the authors record success in tagging the infective larvae of *Wuchereria bancrofti* with the isotope Phosphorus-32. The 2nd and 3rd-stage larvae of *Culex fatigans* were reared in baths containing concentrations of P^{32} as the orthophosphate. Three days after emergence the mosquitoes were fed on patients with high microfilarial counts. Twelve days later they were dissected and the infective filarial larvae were dried. The Geiger-Müller counter showed that the activity per larva was consistently about 22 β -counts per minutes.

R.T.L.

148—Veterinary Medicine.

- a. GUTHRIE, J. E., 1956.—“Critical tests with piperazine as an ascaricide in swine.” 51 (5), 235-238.
- b. DRUDGE, J. H., 1956.—“Helminth infections in horses.” 51 (8), 349-357.

(148a) Piperazine hexahydrate and piperazine sulphate appeared to be equally acceptable to pigs, when tested against *Ascaris lumbricoides* infections. An average dose of 48.6 mg. per lb. body-weight of anhydrous piperazine given with the water over 24 hours to 42 pigs in four different experiments was 96.6% efficient. To ensure a full intake of the drug, drinking water was withheld the previous night. Based on critical tests, the suggested optimum dose of anhydrous piperazine is approximately 50 mg. per lb. Both the piperazine compounds were well tolerated as single doses and also in amounts above the therapeutic dose given continuously with the water for 38 days.

G.I.P.

(148b) Drudge summarizes current knowledge of the helminth infections of horses and their treatment and control.

R.T.L.

149—Veterinary Record.

- a. POYNTER, D., 1956.—“A comparative assessment of the anthelmintic activity in horses of four piperazine compounds.” 68 (20), 291-297.
- b. GIBSON, T. E., 1956.—“A controlled test of tetrachlorethylene as an anthelmintic against *Trichostrongylus axei* in cattle.” 68 (21), 317-318.
- c. POYNTER, D., 1956.—“Piperazine-1-carbodithioic acid as an anthelmintic against *Parascaris equorum* in horses.” 68 (27), 429-431.
- d. THOMAS, R. J. & STEVENS, A. J., 1956.—“Some observations on *Nematodirus* disease in Northumberland and Durham.” 68 (29), 471-475.

(149a) Experiments with four piperazine compounds, adipate, citrate, phosphate and carbodithioic acid, showed them to have an equal anthelmintic effect in horses when used at the rate of 200 mg. of piperazine base per kg. body-weight. Reduction of the dosage rate of piperazine-1-carbodithioic acid to 100 mg. per kg. body-weight appeared to be as efficient against small strongyles, and probably also *Parascaris equorum*, as the higher dosage rate. No definite conclusions were reached as to the relative palatability of the four compounds. They were accepted by the majority of horses when given with a bran mash.

D.M.

(149b) An experiment, using six artificially infected calves, showed that tetrachlorethylene as an anthelmintic has a variable action, and at its best, after a dose of 30 ml., was only 77% efficient. As toxic symptoms follow its administration, there appears no reason for preferring it to phenothiazine.

D.M.

(149c) Trials on 12 horses showed that piperazine-1-carbodithioic acid, administered at the rate of 100 mg. per kg. body-weight, is an efficient anthelmintic against *Parascaris equorum*. The piperazine compounds have now largely replaced carbon disulphide for treating ascarids, and this allows *Gastrophilus* spp. to develop without hindrance. It is pointed out that these insect larvae must be considered as possible causal agents in cases of unthriftiness in the autumn and winter, even after treatment with piperazine. D.M.

(149d) A detailed description of nematodiriasis is given, covering the seasonal incidence, animals affected, grazing history, mortality, post-mortem findings and associated conditions. The disease was often found associated with pulpy kidney disease, and the value of control measures against the latter is emphasized. An experiment was carried out on the survival of free-living stages of *Nematodirus* spp. on pasture, and it was shown that the larval stages of *N. battus* and *N. filicollis* can survive for at least 110 months, and are resistant to summer and winter conditions. The results of the experiment are discussed in relation to the control of the disease. In order to avoid infection farmers are recommended not to graze lambs on pasture which carried lambs the previous year. Where this is impracticable the period late April-mid June represents the minimum period for which contaminated pastures should be closed to lambs. D.M.

150—Veterinary Reviews and Annotations. Weybridge.

- a. WHITTEN, L. K., 1956.—“The treatment of tapeworm infestations in man and animals.” 2 (1), 1-24.

(150a) In this review of the literature on the treatment of cestode infections, published up to 1954, Whitten summarizes *in vitro* and *in vivo* techniques, critical tests, standard test treatment, the pharmacological action of drugs on cestode preparations *in vitro* and the anticestode activity *in vivo* of materials of plant origin, inorganic and metallo-organic compounds, synthetic organic compounds and of mixtures. Those drugs with specific action on individual species in man, domesticated animals and experimental animals are then considered and the conclusion is reached that the following only are suitable for clinical use: in man, extracts of male fern, mepacrine hydrochloride and Tenamid; in the dog, arecoline hydrobromide, arecoline-acetarsol, dichlorophen and Anthelin; in the cat, arecoline-acetarsol and dichlorophen; in sheep, lead arsenate, copper sulphate and nicotine sulphate; in cattle, lead arsenate, and in poultry di-*n*-butyl tin dilaurate, hexachlorophene. Some of the more common proprietary names which appear in the literature are listed in an Appendix. R.T.L.

151—Wiadomości Parazytologiczne. Warsaw.

- a. GERWEL, C., 1956.—“Najwłaściwsze metody rozpoznawcze i lecznicze schorzeń pasożytniczych przewodu pokarmowego człowieka.” 2 (1), 3-17. [English & Russian summaries pp. 16-17.]
- b. STEFANSKI, W., 1956.—“Czy prace parazytologiczne wymagają przygotowania zoologicznego?” 2 (1), 19-25. [English & Russian summaries p. 25.]
- c. KOZAR, Z., 1956.—“Zagadnienia parazytologii lekarskiej w Republice Gruzjińskiej ZSRR.” 2 (1), 27-31. [English & Russian summaries p. 31.]
- d. KUŹMICKI, R., 1956.—“Badania nad skutecznością nasion dyni (Sem. Cucurbitae) w leczeniu zarażeń tasieńcem nieuzbrojonym.” 2 (2), 85-92. [English & Russian summaries pp. 91-92.]
- e. PAWŁOWSKI, Z., 1956.—“Wyniki leczenia taeniarhynchosis nasionami dyni Semina Cucurbitae.” 2 (2), 93-96. [English & Russian summaries p. 96.]
- f. GRABDA, E., 1956.—“O potrzebie szkolenia zootechników w parazytologii.” 2 (2), 97-100. [English & Russian summaries p. 100.]

(151a) Gerwel suggests that the method of laboratory investigation used in the campaign for the eradication of intestinal parasites of man in Poland should be simplified by the employment of the decantation method only instead of decantation and the Fülleborn, Faust and Rivas' techniques and by using decantation only in hospital laboratories instead of the techniques of Telemann, Rachmanova and Fülleborn. In the treatment of *Enterobius* infections

Piperazina effervescens was efficacious in 80% of 600 cases, methyl violet in 83% of 33 cases, hexylresorcinol in 50% of 470 cases. Ascaris infections were cured by santonin in 84% of 75 cases and by hexylresorcinol in 42.5% of 47 cases. In Trichuris infections arsenical preparations cured 55.5% of 27 cases and hexylresorcinol 38.9% of 108 cases. For *Taenia saginata* atebrin was efficacious in 75% of 29 cases treated, 11 out of 15 cases who also received luminal were cured by pumpkin seeds. R.T.L.

(151b) As the title indicates, this article points out the necessity of preliminary zoological training for workers on parasitology and quotes some of the errors which have appeared in parasitological papers published by physicians. R.T.L.

(151c) The most important problems of medical parasitology in the Georgian Republic are briefly discussed, including the treatment with carbon tetrachloride of hookworm which is prevalent around the Black Sea and of Ascaris infections with oil of chenopodium. R.T.L.

(151d) *Taenia saginata*, with its scolex, was passed by 3 out of 25 persons after a single dose of 200-400 gm. of pumpkin seed, and by 3 of the 8 persons who received a second treatment. The tapeworm with its scolex was passed by 8 out of 45 individuals treated simultaneously with pumpkin seed and a small dose of atebrin and by 13 out of 22 individuals when this combination was administered a second time. R.T.L.

(151e) Thirty-nine out of 60 individuals were cured of *Taenia saginata* infection when treated with pumpkin seed (70 gm. to 400 gm. according to age) and 0.015 gm. of luminal twice followed within four hours by Carlsbad salt. R.T.L.

(151f) This article deals with the inadequacy of the instruction in parasitology given to zootechnicians in seven high schools in Poland. R.T.L.

152—Wissenschaftliche Zeitschrift der Universität Rostock.

- a. DOLIWA, U., 1956.—"Experimentelle Untersuchungen an Kartoffelnematoden (*Heterodera rostochiensis* Wollenweber)." Mathematisch-Naturwissenschaftliche Reihe, 5 (1), 133-149.

(152a) The author tested 30 vital stains for their effects on living and dead larvae of *Heterodera rostochiensis*. The basic dye crystalline chrysoidin was shown to stain dead larvae a diffuse lemon yellow, while in living larvae it stained intestinal granules brownish-yellow to orange but the rest of the body remained colourless. These results were obtained whether larvae were killed by heat or by chemicals, and whether they were within the egg-shell or outside it. The stain is not toxic at the concentrations used, namely 1:20,000 to 1:50,000, but it takes 19 hours to stain free larvae, 24-36 hours for larvae in eggs and at least 3 days for larvae within cysts. Using chrysoidin for testing viability it was shown that, in water, eggs and cysts were killed in 4 hours at 40°C., in 40 minutes at 50°C. and in 5 minutes at 60°C. Free larvae were killed in 2½ hours at 40°C., in 15 minutes at 50°C. and in 5 minutes at 60°C. For air dried cysts, 60 hours at 60°C. proved lethal while at 50°C. larvae were still alive in the cysts after 4 days. Study of the chemical nature of the cyst wall, larval cuticle and egg membrane showed them to be protein: no chitin was found. Nematode eggs in 0.1% potassium permanganate hatched after 6-8 hours, whether alive or dead. It is concluded that oxidation of substances in the egg membrane enables the larvae to break out. Subsequent movement of the larvae is a secondary phenomenon and is not a prerequisite for hatching. A number of dyes and salts of heavy metals were tested for toxicity to potato eelworm larvae. Methylene blue and malachite green at concentrations of 1:2,000 to 1:10,000 were lethal in 24 hours. Silver nitrate killed hatched larvae in 5½ hours at a concentration of 1:10⁷. A silver coin in a suspension of larvae caused their death in 2-3 days. The other metals were ineffective at the concentrations tested except mercuric chloride, which was toxic in 24 hours at a concentration of 1:10⁴. M.T.F.

53—Zoologicheskii Zhurnal.

- a. USTINOV, A. A., 1956.—[Biological principles of measures for controlling plant nematodes.] 35 (2), 162–172. [In Russian.]

(153a) Ustinov considers the relationships of three plant-parasitic nematodes, namely, root-knot (*Meloidogyne* sp.), stem eelworm of onion (*Ditylenchus dipsaci*) and stem eelworm of potato (*D. destructor*), with the environmental factors of temperature, moisture, pH and salinity of the soil, and how these relationships may affect control measures. Stem nematodes can stand wider fluctuations in conditions than can root-knot nematodes. The ability of onion stem nematode to pass into a state of anabiosis enables it to withstand adverse conditions. Since the potato rot nematode can invade and multiply at low temperatures it can injure tubers during storage. Thus it is suggested that tubers be stored at a low temperature (1°C. to 3°C.) and that potatoes be grown late in the season (in southern Russia) so that soil temperatures are falling when tubers are forming and are below the optimum for nematode development. Damage due to root-knot development occurs in the field only in the southern parts of Russia. With regard to water requirements, drying out of infested soil might give effective control in a warm, dry climate if the soil water-table is low. The threshold point for the invasion of plants by nematodes appears to be near the wilting point of plants. Since the tolerance of nematodes to both pH and salinity of the soil is greater than that of plants these factors cannot be used in control. The relationships between the three nematodes and their host plants are discussed and the effects of the parasites on the plants described. It is suggested that the biochemical activities of the nematodes should be studied. The digestive ferments produced by them include proteolytic ferments, and amylase has been found in the secretions of root-knot and potato rot nematodes. The activity of amylase produced in a day by stem nematodes was three and a half times higher at 20°C. than at 5°C. to 7°C. As general practical conclusions Ustinov mentions crop rotations, bare fallow and careful selection of seed potatoes to eliminate those harbouring *D. destructor*. M.T.F.

NON-PERIODICAL LITERATURE

- 154—CAMERON, T. W. M., 1956.—“Parasites and parasitism.” London: Methuen & Co. Ltd. (New York: John Wiley & Sons, Inc.), xix+322 pp.

In this book, intended primarily for zoologists, Cameron has treated parasitism as a branch of oecology and has avoided, as far as possible, any anthropocentric bias. In the first part, which is a general survey of parasites, a number of representative types of helminths are discussed together with a description of their morphology, a brief account of what is known of their physiology and diagrammatic representations of their life-histories. Following these are chapters on the host and its reactions, on parasitism (in its widest sense), and on infectious disease, in which the differences between epidemics due to helminths and to protista are pointed out. In the chapter on the factors involved in the distribution of parasites, hookworms and filariae are cited as the main helminthic examples. The principles of control of parasites and parasitic diseases are outlined, including methods of control in the host (usually by chemotherapy), outside of the host (e.g. by proper disposal of sewage and manure and by attacking intermediate hosts) and by protection of the host (e.g. the wearing of shoes to prevent the acquisition of heavy infections with hookworms and the avoidance of overstocking pastures with live-stock). The last chapter, which is on host specificity and the evolution of parasites,

is chiefly devoted to a consideration of the situation in the pinworms and the bursate nematodes and to the helminthological evidence for the relationships of groups of hosts. There is annotated bibliography, a classification of parasites mentioned in the text and a combined glossary and index.

- 155—GOODEY, T., 1956.—“The nematode parasites of plants catalogued under their hosts.” Technical Communication. Commonwealth Bureau of Agricultural Parasitology (Helminthology), St. Albans. Revised by J. B. Goodey & M. T. Franklin, 140 pp.

Dr. Tom Goodey's catalogue of plant-parasitic nematodes published in 1940 has been rearranged and revised by J. Basil Goodey and Mary T. Franklin. This new edition registers the many new hosts and nomenclatural changes which have appeared in the literature during the past fifteen years and brings the record up to the end of 1954.

R.T.T.